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UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Agricultural Economics

Agricultural Economics Bibliography No. 74



THE SOYBEAN INDUSTRY

A Selected List of References on the Economic Aspects  
of the Industry in the United States, 1900-1938

Compiled by  
Helen E. Hennefrund and Esther M. Colvin  
Under the Direction of Mary G. Lacy, Librarian  
Bureau of Agricultural Economics

Washington, D. C.  
October 1938



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THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT

NO. 100

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT

1950

## CONTENTS

	Page
Sources Consulted.....	III-IV
Foreword.....	VI-VII
General.....	1-59
Cost of Production and Returns.....	59-63
Grading and Standardization.....	63-66
Harvesting.....	66-73
Marketing.....	73-78
Oil, Protein and Moisture Content.....	78-84
Statistics.....	84-95
Storage.....	95-97
Utilization.....	98-261
General.....	98-111
Industrial Uses.....	111-146
Oil, Oilmeal, and Oilcake.....	124-146
Farm Uses.....	146-219
Feeding.....	165-219
Cattle.....	181-197
Hogs.....	197-212
Horses and Mules.....	212
Poultry.....	213-217
Sheep and Lambs.....	217-219
Food Uses.....	220-261
Patents Relating to Soybean Products and Processes.....	261-279
Index.....	280-474



## SOURCES CONSULTED

Card catalogues of the following libraries:

U. S. Department of agriculture

U. S. Department of agriculture, Bureau of agricultural economics

Indexes and Periodical Sets:

Agricultural Economics Literature; issued by U. S. Department of agriculture, Bureau of agricultural economics, Washington, D. C. v. 1, 1927 to v. 12, no. 6, June 1938.

Agricultural Index; issued by the H. W. Wilson Co., New York. v. 1, 1916 to v. 23, no. 6, June 1938.

American society of animal production. Record of proceedings of annual meeting, 1908-1937. 389.9 Am3R

Association of southern agricultural workers. Proceedings of the...annual convention, 2d-38th. 1900-1937. 4 C82

Chemical Abstracts; published by the American Chemical Society, Easton, Pa. v. 1, 1907 to v. 32, no. 11, June 10, 1938.

Experiment Station Record; issued by U. S. Department of agriculture, Office of experiment stations, Washington, D. C. v. 11, 1899-1900 to v. 78, no. 6, June 1938.

Industrial Arts Index; issued by the H. W. Wilson Co., New York. v. 1, 1913 to v. 26, no. 6, May 1938.

Public Affairs Information Service. Bulletin; issued by Public affairs information service, New York. v. 1, 1915 to v. 24, no. 39, July 2, 1938.

Society of Chemical Industry. Journal. v. 19, 1900 to v. 57, no. 4, April 1938.

This includes the Review volume, and the Transactions and Abstract volume.

The abstracts section is discontinued with v. 44, 1925, and continued as British Chemical Abstracts. This has been checked from 1926 through April 1938, in Part B, Applied Science.

Bibliographies:

[Deweese, Anne.] A few references on soybeans and soybean oil (Available in Department of agriculture library) 2pp., type-written. [Washington, D. C.] 1934. Vertical File. Bibliographies (Soybeans)

Feldkamp, Cora L. Selected list of references on the cost of producing field crops. 9pp., processed. Washington, D. C., U. S. Dept. of agriculture, Office of farm management, 1920. Vertical File. Bibliographies.



- Herb, Mamie I. The soybean industry in the United States.  
A selected list of references on the economic aspects of the industry. 19pp., typewritten. [Washington, D. C.] Nov. 6, 1931. Vertical File. Bibliographies (Soybeans)
- LeClerc, J. A. Partial list of references on soybean milk. 4pp., processed. [Washington, D. C.] U. S. Dept. of agriculture, Bureau of chemistry and soils, Food research division, 1936. Vertical File. Bibliographies (Soybeans)
- Miller, Ernest I. Soy beans; a partial bibliography. 18pp., typewritten. Knoxville, Tennessee Valley authority, Technical library, 1935. 173.2 T25So
- Phillips, C. Louise. Abstracts of published material on oil and protein content of soybeans. 7pp., typewritten. [Washington, D. C.] March 1931. Vertical File. Bibliographies (Soybeans)
- Seattle, Wash. Public library. Technological division. Bibliography division. Bibliography on soy beans. 36pp., typewritten. Seattle, March 30, 1930. 241 Sel
- U. S. Department of agriculture, Bureau of chemistry and soils, Food research division. Partial list of references on soy beans and soy bean products. 3pp., processed. Washington, D. C., Dec. 1, 1933. Vertical File. Bibliographies (Soybeans)
- U. S. Department of agriculture. Yearbook of agriculture, 1900-1937. Washington, D. C., 1901-1937.



## FOREWORD

This bibliography contains references to material published on the economic aspects of the soybean industry in the United States, from 1900 through June 1938. References have been included to material dealing with the utilization of the soybean in industry, in agriculture, and in nutrition; with the cost of production, harvesting, storing, marketing, and grading; and with the oil, protein and moisture content of the bean.

References on the botany, chemistry and culture of soybeans and on varieties have been omitted except where they have appeared incidentally with other material. Recipes, where food value is not a part of the content; articles on processing methods and refining of soybean oil and the factors affecting them have also been omitted. Works in foreign languages and works published abroad have not been included except where the material relates to the industry in the United States.

A list of patents relating to soybean products and processes has been included. This list is as comprehensive as it was possible to make it from a search made in the U. S. Patent Office under Soybeans and related headings. It is realized, however, that there may be subjects under which such patents might appear which were not checked.

Call numbers following the citations are those of the U. S. Department of Agriculture Library, unless otherwise noted. "Libr. Cong." preceding a call number indicates that the publication is in the Library of Congress.

A request for published reports of proceedings of the National Soybean Oil Manufacturers Association (a phase of the industry now represented by the National Soybean Processors Association) brought the reply that no proceedings had been published. A few abstracts of talks given at the annual meetings were found in the Grain and Feed Journals Consolidated, and are included.

The Soybean Marketing Association has been inactive for the past three or four years, and therefore has no published material available.

The compilers are indebted to Dr. J. W. Hayward of the recently organized Soybean Nutritional Research Council for the statement that the Council "was organized the latter part of 1937 to act as an independent group for disseminating existing knowledge regarding the soybean and its products and encourage further research on same." Acknowledgement of assistance is also made to Mr. W. J. Morse, Bureau of Plant Industry, U. S. Department of Agriculture, to Dr. O. E. May,

Director of the Regional Soybean Industrial Products Laboratory of  
the Bureau of Chemistry and Soils at Urbana, Illinois, and to Dr.  
J. A. LeClerc of the Food Research Division, Bureau of Chemistry and  
Soils, U. S. Department of Agriculture.

Mary G. Lacy, Librarian  
Bureau of Agricultural Economics  
U. S. Department of Agriculture

October 1938.

## THE SOYBEAN INDUSTRY

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#### GENERAL

1. Abbott, John B. The soybean in Massachusetts. Mass. Agr. Col. Ext. Leaflet 90, 6pp. Amherst, 1925.  
The varieties suited to Massachusetts, and the economic uses of the soybean are among the matters discussed.
2. Adams, G. E. The soy bean. R. I. Agr. Expt. Sta. Bull. 92, pp. 119-127. Kingston, 1903.  
"This constitutes a part of the Annual Report for 1902-1903."  
A brief history of the bean, a discussion of its culture and its agricultural uses are included.
3. Allis-Chalmers Manufacturing Co., Milwaukee. The versatile soy bean. 18pp. [Milwaukee, Allis-Chalmers Mfg. Co., 1930.] (Bulletin 1246) 60.3 A15  
"Allis-Chalmers will attempt to give in this bulletin a resume of the soy bean industry, its growth, possible uses of the oil, general information on seeding, and cultivation; possible profits to the farmer and miller, and a general outline of a milling process which they have developed..." -- Preface.
4. American soybean association. Proceedings, 1925/27-1930; 1935-[1937]. [n.p.] 1928-[1937]. 60.39 Am3  
1925-1927 are v. 1; 1928-29, v. 2; 1930, v. 3.  
1930 is 11th annual business meeting; 1935-[1937] are 15th-17th annual meeting.  
Proceedings, 1931-1934 were "not published."  
V. 1 (1925-1927, 6th-8th) includes brief reports and programs of the first five field meetings and also condensed reports and minutes of the 8 annual meetings held since 1920:  
The Association was founded Sept. 3, 1920 at Camden, Indiana, as the National Soybean Growers' Association, but was not formally organized until its sixth meeting, Dec. 1, 1925, when a constitution and by-laws were adopted, and it became the American Soybean Association.  
Partial contents: v. 1. The economic value of the soybean to Southern agriculture, by F. P. Latham, pp. 63-65; Domestic production of soybean oil and oil meal, by I. C. Bradley, pp. 65-69;



Soybeans for human food, by M. F. Deming, pp. 71-76; The development of quality standards for soybeans, by J. E. Barr, pp. 77-83; The economic value of the soybean to Northern agriculture, by J. C. Hackleman, pp. 83-91; Soybeans in hog production, by O. G. Hankins, pp. 91-96; Soybeans in the Eastern States, by Nickolas Schmitz, pp. 98-100; Relation between the soybean grower and the oil mill, by F. A. Wand, pp. 104-106; Seed frauds in soybean varieties, by R. W. Hamilton, pp. 106-110; Community growing, handling and sale of soybean seed, by John T. Smith, pp. 113-114; Soybeans in South Georgia, by W. J. Davis, pp. 114-118; Soybeans in the Mississippi Delta, by W. E. Ayres, pp. 118-121; Small grains after soybeans, by W. E. Riegel, pp. 121-123 [soybeans in crop rotation to reduce production costs]; Putting soybeans on hoof, by Taylor Fouts, pp. 123-126 [soybeans for livestock feeding]; The distribution of soybeans in the United States, by W. J. Morse, pp. 132-137; Producing soybean seed for the oil mills, by C. B. Williams, pp. 137-145; Soybeans for Southern livestock, by G. S. Tompleton, pp. 145-148; Combines for harvesting soybeans and other crops, by John T. Smith, pp. 148-149; Soybeans and corn in the Mississippi Delta, by E. C. McInnis, pp. 150-154; The soybean industry and United States standards, by J. E. Barr, pp. 154-159; The present outlook of the soybean industry in the United States, by W. J. Morse, pp. 167-171; Soybeans as related to pork production in the United States, by E. Z. Russell, pp. 176-182; Soybeans in Indiana (i.e. Soybeans in relation to soil fertility in Indiana) by K. E. Beeson, pp. 182-187; Soybeans in North Carolina (i.e. The soybean's contribution to North Carolina agriculture) by R. Y. Winters, pp. 187-190..

- 4a. v. 2. Soybeans pay in fattening hogs, by C. M. Vestal, pp. 12-13; Soybeans for dairy cattle, by J. H. Hilton, p. 14; Soybeans for fattening lambs, by Claude Harper, pp. 15-17; Soybeans for poultry, by C. W. Carrick, pp. 17-18; The proper place for soybeans in the system of farming, by E. C. Young, pp. 19-21; Harvesting soybeans with the combine, by I. D. Mayer, pp. 21-22; Commercial prospects with soybeans, by Wilfred Shaw, pp. 28, 30-33; The outlet of soybean products, by Roy Chasteen, pp. 33-34; Commercial outlet for soybeans, by Frederick A. Wand, pp. 35-36; Some commercial uses of the soybean, by J. L. Cartter, pp. 44-47; Why grow soybeans, by J. Benj. Edmondson, p. 57; Twenty years with soybeans. Conclusions derived from experience on McHarry Farms, contributed by Charles L. McHarry, William E. Riegel, Lewis J. Withrow, Edmund W. Stafford, James M. Crumbaker, pp. 58-91; Soyland, by Noah Fouts, Taylor Fouts and Finis E. Fouts, pp. 92-97; The Mid-State soybean association and the Dunfield, by The Association, pp. 101-106 [cooperative growing and marketing of soybeans]; Certified seed, by J. Frank Edmondson, pp. 108-109.

- 4b. v. 3. Making the best use of soybeans in hog feeding. 1. Soybean crop has limited use in rations for swine, by W. E. Carroll, pp. 7-15; 2. Objections for fattening swine do not apply to soybean

oil meal, by W. E. Carroll, pp. 16-18; Soybeans for beef-cattle feeding, by H. P. Rusk, pp. 19-29; Making best use of soybeans in feeding dairy cattle, by W. B. Nevens, pp. 30-36; Soybean harvesting machinery, by A. L. Young, pp. 37-44; Costs of growing and harvesting soybeans in Illinois, by R. C. Ross, pp. 46-56; Soybean hay studies, by George H. Dungan, and C. A. Van Doren, pp. 65-68; Soybean insects, by W. P. Flint, pp. 83-85 (Includes Insect control by the use of soybeans); Shrinkage of soybeans and soybean hay and soybean oil paint investigation, by W. L. Burlison, pp. 86-87; Aims and purposes of the Soybean Marketing Association, by J. H. Lloyd, pp. 89-95.

- 4c. 15th, 1935: The American soybean association, by W. J. Morse, pp. 3-4; Commercial soybean prices, by E. F. "Soybean" Johnson, pp. 5-9; The national crisis facing soybean growers in the United States, by W. E. Riegel, pp. 10-11; overproduction and importation of soybeans; Utilization of soybean oil with special reference to paint, by W. L. Burlison, pp. 12-15, 17; Soybean oil in the foundry, by Lamar Kishlar, pp. 19-20; Processing soybean oil meal, p. 21; Soybeans and soybean products for dairy cows, by J. W. Wilbur and J. H. Hilton, pp. 24-25; Soybeans and soybean oilmeal for pigs, by W. L. Robison, pp. 27-29; Growing soybeans to meet grading standards, by F. E. Robbins, pp. 33-34; Soybeans: Ancient and modern uses, by W. J. Morse, pp. 34-35, 37; The composition of soybean flour from different processes of manufacture; Baking tests and value of soybean flour, by J. A. LeClerc, pp. 39-43; Green vegetable soybeans, by W. J. Morse, pp. 44-45.

- 4d. 16th, 1936. Research program of the Regional soybean industrial products laboratory, by O. E. May, pp. 3-6; Soybeans and the Farm chemurgic council, by H. E. Barnard, pp. 8-14; Soybeans and soybean flour and the effect of storage conditions upon the composition of soybeans, by J. A. LeClerc and L. H. Bailey, pp. 16-20; Soy beans in the human diet, by M. Dorothea Van Gundy, pp. 22, 24; Feeding soybeans and soybean oil meal, by G. Bohstedt, pp. 25-26, 28; The nutritive value of soybean oil meal as affected by the method of processing soybeans, by J. W. Hayward, pp. 29, 31-32, 34-35; The processing of soybeans, by I. C. Bradley, pp. 37-39; Dust explosion prevention in soybean processing plants, by David J. Price, pp. 40-45; Use of soybean oil in paint, by M. F. Taggart, pp. 47-48; Protecting the American soybean market, by W. E. Riegel, pp. 49-51; Export demand for soybean products, by E. F. Johnson, pp. 53-54; Soybeans in the United States. In relation to world production and trade, by W. J. Morse, pp. 55-56, 58-60.

- 4e. 17th, [1937] The research program of the Bureau of chemistry and soils on industrial utilization of farm products, by H. T. Herrick, pp. 3-9, (Describes the projects of the Industrial Farm Products Research Division of the Bureau of Chemistry and Soils.); The U. S. Regional soybean industrial products laboratory, Urbana, Ill., by O. E. May, pp. 10-11, (Organization and research program of the



laboratory.); Work of the agronomic and analytical divisions of the U. S. Regional soybean industrial products laboratory, by J. L. Cartter, and R. T. Milner, pp. 12-15, (Objectives and purposes of the work.); Soybean variety studies of the United States Department of agriculture, by W. J. Morse, pp. 16-18; Edible varieties of soybeans, by Sybil Woodruff, pp. 19-22, (Gives best varieties for food use.); Behavior of soybeans as a vegetable crop, by J. W. Lloyd, pp. 23-28, (Results secured with various varieties.); Soybeans and soybean products for beef cattle and sheep, by R. R. Snapp, pp. 29-33; Experiments in time of harvesting soybeans for hay, by W. B. Nevens, pp. 34-36 ("This paper reports the results of three years' investigations dealing with the time of harvesting soybeans for hay."); Soybeans and soybean products in pork production, by Sleeter Bull, pp. 37-43, (Use of soybean seed and soybean oil meal as a feed for hogs.); Recent results in soybean breeding and genetics, by C. M. Woodworth, pp. 44-48; What we know about the fertility value of soybeans, by O. H. Sears, pp. 49-51; (Describes the physical effects of soybeans upon the soil, the biological activity in the soil following soybeans, and the relation of soybeans to the succeeding crop.); Changes in costs and practices in the production of soybeans, by R. C. Ross, pp. 52-57, ("Costs as we shall discuss them represent the total input of labor, equipment, seed, fertilizer and the like used directly in growing and harvesting the crop figured at prevailing rates, plus a charge for the use of land sufficient to cover taxes and interest on the land value..." The future trend of costs is also discussed.); Soybean harvesting studies, by A. L. Young, pp. 58-62, (Traces the soybean harvesting studies and the results obtained from 1930 to the present.); Convention sees Pennsylvania railroad's soybean exhibit car, p. 63.

5. Arny, A. C., Brookins, W. W., Hodgson, R. E. Soybeans for Minnesota. Minn. Univ. Agr. Ext. Div. Spec. Bull. 134, 14pp., rev. St. Paul, August 1937.

World production of soybeans, production in the United States, composition and uses of soybeans, results from feeding trials at various experiment stations, varieties and yields per acre, harvesting for hay, and threshing and drying the seed are discussed.

Table 1 gives the acreage of soybeans produced for seed, yields per acre, and December 1 farm price for the period 1932-36 in the states leading in production.

Arny, A. C., and Hodgson, R. E. Grow more soybeans in Minnesota. Minn. Univ. Agr. Ext. Div. Spec. Bull. 134, 11pp., rev. April 1935, is an earlier revision of this same bulletin, as is Arny, A. C., Crim, R. F., and Hodgson, R. E. Soybeans for Minnesota. Minn. Univ. Agr. Ext. Div. Spec. Bull. 134, 12pp., rev. St. Paul, May 1936.

6. Ayres, W. E. Much feed at little cost. Oats and soybeans will help out. Prog. Farmer, Miss. Valley ed. 39(40): 940. Oct. 4, 1924. 6 So81

This is an account of experiments in planting soybeans and oats at the Delta Experiment Station at Stoneville, Miss., 1922-24. The financial returns and labor requirements for the crop are cited.

7. Barnard, H. E. Soy beans and products - their uses in commercial feeding. Grain and Feed Rev. 25(12): 18-21. August 1936. 280.28 C78

Address delivered before the Forty-eighth Annual Convention of the American Feed Manufacturers' Association at White Sulphur Springs, West Virginia, on June 13, 1936.

Following a brief history of the soybean in this country and the development of the industrial uses of the beans and the growth of the processing industry, the methods of oil extraction are taken up, and the uses of the oil meal in feeding with the conflicting results obtained are given.

Abstract in Grain and Feed Journals Consolidated 77(2): 86. July 22, 1936 under title "Soybeans in Commercial Feeding." 298.8 G762

8. Barr, J. E. Seedsmen and the soybean industry. Seed World 15(2): 18-19. Jan. 18, 1924. 61.8 Se42

The writer points out the rapid development of the soybean industry and the part seedsmen have played in it. The future of the industry is also discussed.

9. Barr, J. E. Soy beans make good cash crop for Indiana farmers. Demand continues greater than supply. Ind. Farmer's Guide 80(4): 89. Jan. 26, 1924. 6 In2

"More soy beans were harvested in Indiana, Illinois, and other corn-belt states last year than ever before. If properly marketed or used they will add several hundred thousand dollars to the farmers' cash income. The greatest net cash return for the crop is what is wanted and to get this result certain conditions have to be met."

Storing soybeans on the farm and selling them as the requirements of manufacturers demand, is suggested for assuring a continuous supply to the mills and a steady market.

10. Beeson, K. E. Soybeans for Indiana farms. Ind. Purdue Univ. Dept. Agr. Ext. Leaflet 151, 6pp. Lafayette, 1930.

The writer brings out the uses of soybeans, the varieties adapted to Indiana, and harvesting methods for hay and seed.

11. Benton, R. H., Jr. Soy bean cultivation. Prog. Farmer (Miss. Valley ed.) 37(11): 250. March 18, 1922. 6 So81

The article includes a passage on harvesting and threshing and the place of soybeans as a forage crop.



12. Biazzo, R. Sulla determinazione del contenuto in olio dei semi oleosi. *Annali di Chimica Applicata* 10(9-10 and 11-12): 130-133. 1918. 385 An7  
 Gives the factors ordinarily considered in making a commercial quotation of oil seeds, and the method of determining oil content by extraction with the Soxhlet extractor.
  
13. Biggar, H. Howard. Soybeans - South Dakota's new crop. *Dakota Farmer* 41(7): 429-430. Apr. 1, 1921. 6 D14  
 The history of the soybean, reasons for its increasing acreage in the United States, and experiences of farmers growing the beans in South Dakota are among the matters discussed.
  
14. Bill, F. W. Turning soy beans into money. Farmers of Piatt county, Illinois, build co-operative soy bean mill. *Wallaces' Farmer* 48(3): 301. Feb. 23, 1923. 6 W15  
 The farmers have organized a cooperative company and set up a soybean oil extracting plant at Monticello. "The movement has a double purpose. It is intended to forward the work of replacing an unprofitable crop, oats, by a profitable one. By reducing the oat acreage, and to an extent, that of corn, it is expected to help stimulate the price of those crops."
  
15. Blackwell, C. P., and Jeffords, S. L. Soy beans. *Clemson Agr. Col., S. C. Ext. Circ.* 36, 12pp. Clemson College, 1922. 275.29 So8F  
 In cooperation with the U. S. Department of Agriculture, Extension Service.  
 Part of the circular is given over to harvesting methods and the uses of the crop.
  
16. Bois, D. Les plantes alimentaires chez tous les peuples et à travers les âges. Histoire, utilisation, culture. 4v. Paris, Paul Lechevalier, 1927-1937. (*Encyclopédie Biologique*, v. I, III, VII, XVII.) 452.8 B63  
 Fourth edition of *Le Potager d'un Curieux; Histoire, Culture et Usages de 250 Plantes Comestibles, Peu Connues ou Inconnues*, by A. Paillieux and D. Bois.  
 Vol. I. Phanérogames légumières. Contains a description of the soybean, pp. 120-130, including the history of the plant in various countries, the oil and its uses, the preparation of soybean cheese and soy sauce, the nutritive value of the soybean, the place of the soybean in the culture of various countries including the United States, yields of various varieties, and use as a forage crop.  
 Vol. III. Plantes à épices, à aromates, à condiments. Shoyu, pp. 153-155, describes soy sauce and its preparation.



17. Bontoux, Émile. Le soja et ses dérivés. Les Matières Grasses 4(36): 2195-2199; (37): 2239-2243; (39): 2326-2329; (40): 2364-2366; (41): 2405-2407. April 25-May 25, July 25-September 25, 1911. 307.8 M42  
Bibliography, p. 2407.

Among other things, this study of the soybean and its products takes up the history of the plant; its production in various countries; its chemical composition; food products made from it in the Far East; the use of the soy as an oil plant in the Far East, Europe and the United States; physical and chemical properties of soy oil; and its applications and uses in industry.

18. Bottari, Fulvio. La soja: nella storia, nell'agricoltura e nelle applicazioni alimentari ed industriali. 243pp. Torino, Genova, S. Lattes & C., 1923. 60.3 B65

"This volume treats of the origin and history of soy beans, methods and extent of production in different countries, uses for food and feedstuffs, and industrial applications of the crop." - Expt. Sta. Rec. 52: 636. 1925.

19. Bressman, E. N. Bet on beans. Successful Farming 35(4): 20, 96. April 1937. 6 Sul2

"Soys are rough-and-tumble crops with a record for off-season yields, and they enjoy a constant demand as hay, high-protein feed, human food, and industrial raw materials." Prices brought by oilmeal, amount of soybean oil production in the United States, uses for the oil and meal and prices received for beans are considered.

20. Briggs, George M. Grow soybeans. Wis. Agr. Col. Ext. Serv. Spec. Circ. [March? 1920:], [5]pp. Madison. (Grow More Feed Series, No. 2.) 275.29 W75S

Although mainly on cultural methods, this pamphlet includes the reasons for planting soybeans.

21. Brown, B. A. El cultivo de la soja. La Hacienda 21(5): 138-141. May 1926. 6 H11

The writer briefly discusses the introduction of the soy in the United States, its adaptation, the use of soys for hay, silage, for pasture and as a green fertilizer, and their cultivation and harvesting.

22. Brown, B. A., and Slate, W. L., Jr. Soy beans in Connecticut. Conn. (Storrs) Agr. Expt. Sta. Bull. 129, pp. 255-287. Storrs, 1925.

The writers point out the increased production of soybeans in the United States, their place in Connecticut agriculture, their uses in Connecticut for hay, silage, soiling, seed, pasture and as a green manure, and briefly discuss harvesting.

23. Burger, A. A. Strayer grows soys. Successful Farming 25(5): 5, 28. May 1927. 6 Sul2

This is an account of the twelve-year experience of Bert Strayer of Black Hawk county (Iowa) in growing soybeans. The harvesting and advantages of the crop are described.

24. Burleson, D. J., and McClelland, C. K. Soybeans. Ark. Agr. Col. Ext. Circ. 230, 8pp. Little Rock. 1927.

The varieties of soybeans and their adaptation, yields of hay from different varieties, harvesting seed and yields of seed from different varieties, and the value of soybeans in soil improvement, are among the topics taken up.

25. Burlison, W. L., and Whalin, O. L. Production and utilization of soybeans and soybean products in the United States. Amer. Soc. Agron. Jour. 24(8): 594-609. August 1932. 4 An34P

"Contribution from the Department of Agronomy, University of Illinois, Urbana, Ill. Also presented at the annual meeting of the Society held in Chicago, Ill., November 19, 1931..."

The following summary is given:

"Soybean acreage harvested for beans has expanded rapidly in the United States since 1925, reaching an estimated production of approximately 18,000,000 bushels for 1931. More than half of the acreage grown each year has been cut for hay. The acreage harvested with livestock has not shown any increase since 1927.

"Imports of soybeans and of soybean cake and meal have always been of minor importance. Soybean oil imports represented significant quantities at the close of the World War, however, but have since diminished to negligible amounts as import duties have become effective. The imports of such competing oils as coconut and linseed have been of greatest importance.

"Approximately one-fourth of the soybean oil being utilized in the United States is going into paints and varnishes, another one-fourth is finding its way to the soap kettle, nearly one-fifth is being used in edible products, and about one-eighth is being consumed in linoleum and water-proofing products. The number of commercial products being placed on the market that contain soybeans or soybean products is increasing rapidly. A most encouraging feature of soybean progress has been the research development in utilization of soybeans and soybean products within the last two years and the corresponding expansion in demand along commercial lines."

Numerous statistical tables, illustrating these facts, are included.

26. Burlison, W. L., and Allyn, O. M. Soybeans and cowpeas in Illinois. Ill. Agr. Expt. Sta. Bull. 198, 20pp. Urbana, 1917.

The section on soybeans, pp. 3-15, takes up the soil and climatic requirements of the bean, culture, harvesting, and the results of variety trials for central Illinois (tests made at Urbana, in Champaign county) and for southern Illinois (tests made at Fairfield, in Wayne county).



27. Burlison, W. L. Soybeans gain popularity. They make good in Illinois. Orange Judd Farmer 66(9): 349, 371. Mar. 1, 1919. 6 Orl  
The article is chiefly on cultivation of the soybean, but also points out the reasons for the popularity of the crop in Illinois.
28. Burr, R. A. The bean that made Manchuria famous. Chinese produce it; Americans consume it; Japanese control the business. Trans-Pacific 3(4): 57-60. October 1920. 286.8 T68  
The author surveys the Manchurian soybean industry, whose largest customer is said to be the United States. He suggests extensive importations of raw materials into the United States as the solution for making the return trip profitable in trade with the Orient, and the investigation of the soybean as an American article of diet.
29. Burt-Davy, Joseph. The soy-bean (*glycine hispida*). Transvaal Agr. Jour. 8(32): 620-626. July 1910. 24 T68  
The writer takes up, among other things, the harvesting of soybean seed, returns of seed, its uses for stock feed and human food, and soybeans as green forage, ensilage, hay, and in the rotation.
30. Calland, J. W. What about soybeans? Grain & Feed Rev. 27(3): 9-11. November 1937. 280.28 C78  
"Mr. Calland appeared before the fall meeting of the Ohio Grain, Mill & Feed Dealers' Association held at Lima on October 6. This resume of his talk tells of the unceasing increase in soybean production and of the active interest shown by industry toward the soybean and its products." - Ed. Note.  
Abstract of the talk also given under title "Soybeans a Coming Crop" in Grain & Feed Jour. Consol. 79(8): 376. Oct. 27, 1937. 293.8 G762
31. Campbell, James T. Growing popularity of soybeans. Farmer's Advocate and Home Mag. 59(1633): 43. Jan. 10, 1924. 7 F22  
This article briefly brings out the growing importance of soybeans in the United States, with reference to the Minnesota exhibit of soybeans at the International Live Stock Hay and Grain Show in Chicago. Growing importance of the crop for Ontario is emphasized.
32. Cates, J. Sidney. More soys. Country Gent. 87(8): 10, 16. Apr. 1, 1922. 6 C833  
"Many farmers see in the beans a sound new money crop."  
"This is one of a series of articles...for the purpose of suggesting to farmers ways of increasing their income."
33. Cates, J. Sidney. The rising tide of soy beans. Country Gent. 90(12): 8, 31. Mar. 21, 1925. 6 C833  
The crop is speeding along on a "Gulf-to-Canada sweep."

34. Cauthen, E. F. Soy beans in Alabama. Ala. Agr. Expt. Sta. Bull. 203, pp. 85-103. Auburn, 1918.

Harvesting soy beans, pp. 99-100; Threshing and storing seed, p. 100; Variety tests for seed, pp. 101-103; Soy bean straw, p. 103; Variety test of soy beans for grain and oil, pp. 104-106; Soy beans for hay, pp. 106-107; Variety tests for hay, pp. 107-109; Mixture of cowpeas and soy beans for hay, pp. 109-114; The soy bean as a soil improving crop, pp. 115-117; Comparative yield of grain from soy beans, corn and cowpeas, pp. 117-118.

Cauthen, E. F. Growing Soy Beans in Alabama. Ala. Agr. Expt. Sta. Bull. 202, pp. 79-84. Auburn, 1918 is "a popular edition of No. 203."

35. Clemson Agricultural college of South Carolina, Extension division. Soy beans. Clemson Agr. Col., S. C., Ext. Bull. 22, 15pp. Clemson College, [n.d.] (Farmers' reading course.)

"Prepared by Representatives of this Division in cooperation with those of the S. C. Cotton Seed Crushers' Association."

The bulletin is in the form of a series of questions and answers on soybeans, some of them relating to history and general use; varieties, adaptations and general use; harvesting and yield; and products and by-products.

36. Connecticut Agricultural experiment station, New Haven, Conn. Tests of soy beans, 1914. Conn. Agr. Expt. Sta. Bull. 185, 17pp. New Haven, 1915.

"The field work connected with these tests was planned and carried out by Mr. H. K. Hayes and his assistant, Mr. Hubbell. The chemical analyses were made under the direction of the chief chemist, Mr. J. P. Street. The results have been prepared for publication by the director [E. H. Jenkins]." - Ed. Note.

For a continuation of this work, see Jenkins, E. H., Street, John Phillips, and Hubbell, C. D. Tests of Soy Beans, 1915. Conn. Agr. Expt. Sta. Bull. 191, 14pp. New Haven, 1916.

The paper considers the uses of the crop, the chemical composition of soybean forage grown for the tests, yields of crops per acre, yields of seed and feeding value of the seed.

37. Cook, I. S., and Kemp, W. B. Soy beans - an important West Virginia crop. W. Va. Agr. Expt. Sta. Circ. 20, 19pp. Morgantown, 1915.

Methods of utilizing soybeans - for seed production, silage, pasture and soil improvement - varieties for special purposes, harvesting for hay and seed, threshing, and the use of soybeans in mixtures are discussed.

38. Cottrell, H. M., Otis, D. H., and Haney, J. G. A new drought-resisting crop - soy beans. Kans. Agr. Expt. Sta. Bull. 92, pp. 19-28. Manhattan, 1900.

Harvesting of the crop, yield, feeding value, cost of production, faults of the bean, fertilizing value, and the profitability of the crop for Kansas are discussed.



39. Cottrell, H. M., Otis, D. H., and Haney, J. G. Soy beans in Kansas in 1900. Kans. Agr. Expt. Sta. Bull. 100, pp. 57-115. Manhattan, 1901.

This bulletin is made up chiefly of reports by farmers of planting tests made during the year. It is said in the conclusion that "a majority of the 292 who reported growing soy beans in 1900 think them a profitable crop, and this with a new crop, in an unfavorable season."

40. Cox, Herbert R. Soybeans for New Jersey. New Jersey Agr. Col. Ext. Bull. 55, 4pp. New Brunswick, 1926.

Reasons for growing soybeans, harvesting them, and their use in mixtures, for silage, for soiling, for seed and grain, and for pastures are briefly outlined.

41. Crane, Helen R. The story of the soya. Sci. Amer. 149(6): 270-272. December 1933. 470 Sci25

This article relates the history of the soybean in the United States, the value of and uses for its oil, its "discovery" in 1917 as a human food and the food elements contained in it, and the various products made from it. The increasing soybean acreage in the United States is pointed out.

42. Cromwell, R. O. Importance of the soybean. Grain & Feed Jours. Consolidated 77(10): 429-430. Nov. 25, 1936. 298.8 G762

"From address...before Agricultural Council of Chicago Ass'n of Commerce."

Describes the increased acreage and production of the soybean in the United States, the methods of removing oil from the beans, the known uses of soybean by-products, uses made of soybeans by 47 companies listed as using soybeans in manufacturing, the United States' foreign trade in soybeans, and the condition of the futures market.

43. Cullison, W. V. The soy bean and commerce. Oil Miller 20(3): 17-18, 20-22. November 1924. 307.8 Oi5

The history of the soybean, uses for it, methods of oil production, and uses for the oil and meal are brought out. The writer states that

"The demand and market for soy bean products, especially the oil, is here and now. Whether or not this demand will be filled by American grown beans, or by beans and oil imported from Manchuria depends upon the American farmer."

44. Dalbey, Dwight S. The cowpea and soy bean in Illinois. Ill. Agr. Expt. Sta. Circ. 69, 15pp. Urbana, 1903.

A section on harvesting is included, as well as one on the feed and fertilizer value of the crops.

45. Darden, W. B. Allied Mills soybean plant dedicated. Flour & Feed 34(9): 22. February 1934. 298.8 F66

The plant of the Allied Mills, Inc. at Portsmouth, Va., is described, and the history of the company outlined. The financial possibilities of the crop are brought out.

46. Davis, Glen D. Soy bean is profitable Texas crop. Eight years of research prove Asiatic legume is adapted to southern soils and climate. East Texas Chamber Com. East Texas 9(12): 6, 26. September 1935. 6 Ea73

"As a commercial crop the soy bean offers a splendid opportunity to East Texas, not only because it restores nitrogen to worn-out cotton land, and because it can be used either as a food or feed crop, but because it possesses tremendous cash sale possibilities."

47. Davis, Glen D. Soy bean meet held at Corsicana. East Texas Chamber Com. East Texas 10(4): 7, 16. February 1936. 6 Ea73

Includes brief outlines of speeches delivered by A. G. Pat Mayse, H. H. Williamson, H. E. Barnard, E. B. Reynolds, H. A. York, J. I. Morgan, B. B. Hulsey, L. E. Robinson, and Landon C. Moore.

48. Dearborn conference of agriculture, industry and science, Dearborn, Mich., 1935. Proceedings of the Dearborn conference of agriculture, industry and science, Dearborn, Michigan, May 7 and 8, 1935. 256pp. [Dearborn, Mich., Farm chemurgic council; New York, The Chemical foundation, 1935.] 281.9 J66 1935

Partial contents: Increasing the use of agricultural products in the automotive industry, by R. H. McCarroll, pp. 57-63. (Describes the use of soybeans in the Ford plant, and its importance to the farming industry. A discussion follows this paper, pp. 63-65.); Cooperation between agriculture and industry, by Earl C. Smith, pp. 70-81. (Mention is made of the outlet in industry for surplus soybeans.)

49. Dearborn conference of agriculture, industry and science, Dearborn, Mich., 1936. Proceedings of the second Dearborn conference of agriculture, industry and science, Dearborn, Michigan, May 12, 13, 15, 1936. 409pp. [Dearborn, Mich., Farm chemurgic council; New York, The chemical foundation, 1936.] 281.9 J66 1936

Running title: Second Dearborn Conference.

"Under the sponsorship of the Farm chemurgic council and the Chemical foundation, inc."

Partial contents: Soy beans as a farm crop, by E. D. Funk, pp. 243-247 (contains a section on United States production and imports); The processing of soy beans, by Clark Bradley, pp. 248-250; The rôle of soy bean oil in paint formulation, by E. E.



Ware, pp. 250-254 (Abstract under title "Soybean Oil in Paints." Chem. Indus. 38(6): 598. June 1936. 381 C426); Soy bean proteins, by W. J. O'Brien, pp. 254-260 (includes a chemical analysis of soybean protein, oil and meal extraction experiments, commercial importance of soybean protein in various industries. Also in Oil and Colour Trades Jour. 90(1927): 1434-1436, 1442. Nov. 13, 1936. 306.8 O152. Abstract in Chem. Indus. 38(6): 593-594. June 1936. 381 C426); Soy bean chemistry, by H. R. Kraybill, pp. 260-265 (from an industrial point of view); Mixing soy bean oil and tung oil, by M. F. Taggart, pp. 265-267.

50. Dearborn conference of agriculture, industry and science, 3d, Dearborn, Mich., 1937. Proceedings. 182pp. Dearborn, 1937. (Farm Chemurgic Journal, v. 1, no. 1, September 1937) 381 F22 v. 1, no. 1. "Soy Bean Committee", pp. 166-169. This is the report of the Soy Bean Committee. A report, "Soy Bean Products", submitted to the Committee at its annual meeting at Dearborn, Mich., May 25, 1937, by E. F. Johnson, is included, pp. 167-169. In it, statistics are given as to the utilization of the commercial soybeans, and the production capacity of processing plants. The Committee report is reprinted in two articles by E. F. Johnson, "Statistics of Soybean Industry" in Grain & Feed Jour. Consol. 78(12): 544. June 23, 1937, and "Soybean Oil Mill Capacity", in Grain & Feed Jour. Consolidated 78(12): 547. June 23, 1937. 298.8 G762
51. Descartes de G. Paula, Ruben. A soja como materia prima para industria. 20pp. Rio de Janeiro, Instituto Nacional de Tecnologia (Ministerio do Trabalho, Industria e Comercio), 1937. 60.3 D45 Text in Portuguese with résumé in French. The writer brings out the importance of the soybean in the general economy and especially as a raw material for industry. The possibilities of the crop for Brazil are considered, and brief studies are made of the chief products of the soybean: oil, cake, flour, lecithin, and casein.
52. Dickey, J. B. R. Soybeans, cowpeas and Canadian field peas. N. J. Agr. Col. Ext. Bull. 23, 23pp. New Brunswick, 1919. The section on soybeans, pp. 4-18, includes discussion of the purposes for which they may be grown, harvesting the crop, and practical experiences of New Jersey farmers with soybeans.
53. Dickey, J. B. R. Soybeans in Pennsylvania. Pa. Agr. Col. Ext. Leaflet 36, 4pp. November 1935. Expected yields and value of growing soybeans, harvesting for hay and seed, and feed value of the ground threshed beans are briefly mentioned.

54. Dies, Edward Jerome. Soy, the midwest's miracle bean. Commerce 53(5): 27-28. June 1936. Libr. Cong. HF1.C4  
Increasing acreage of the soybean, establishment of the soybean research laboratory at the University of Illinois, food and industrial uses for the bean, growth of the industry in the United States, and the need for tariff protection are discussed.
55. Dimmock, F., and Kirk, L. E. Soybeans. Canada Dept. Agr. Pamphlet (n.s.) 155, 18pp. Ottawa, 1934. 7 C16Pa  
"Since the soybean is comparatively new as a farm crop in Canada this pamphlet is intended to give information as to the characteristics of the soybean plant and seed; its adaptation to soil and climatic conditions; the various purposes for which soybeans are used; the most suitable varieties that are available; and general instructions on how the crop should be grown and handled."
56. Dorr, Carl. Soybean mills will stimulate market. Establishment of mills in Iowa may provide outlet for surplus soybeans. Wallaces' Farmer 52(20): 744, 747. May 20, 1927. 6 W15  
"It is probable that there may be several soybean process mills established in Iowa for the purpose of extracting the oil out of the soybean - oil which is worth 10 cents per pound, according to Dr. O. R. Sweeney... The residue after the extraction of the oil can be readily made into soybean oil meal, which is extremely useful as a feed for hogs, cattle (dairy and beef), sheep and poultry, according to the experiments carried out by the various college experiment stations."
57. Dorsey, Henry. Growing soybeans. W. Va. Agr. Col. Ext. Circ. 204, 8pp. Morgantown, 1918.  
Contains sections on the importance of the crop, harvesting, yields, suitable varieties, special uses, use for human food, and in crop rotations.
58. Ducceschi, Virgilio. La soja e l'alimentazione nazionale. 246pp. Milano [etc.] F. Vallardi, 1928. (Biblioteca enciclopedica Vallardi) 389 D85  
Bibliography, pp. 240-246.  
This study on the soybean and its place in national feeding has chapters on the natural history of the soybean with its various applications in rural economy, in human nourishment and in industry; the chemical composition of soybean grain; the biological value of the chief nutrients contained in the grain; food products furnished by the soybean and their digestive utilization; medical applications of the soybean; and the economic problem of the soybean, its value as a cheap source of protein, and yields under cultivation as compared with other grains.



59. Duck, R. W. Growing soy beans in the East. Rural New Yorker 92 (5274): 626. Dec. 23, 1933. 6 R88  
References at end of article.  
Contains sections on handling and harvesting the beans, suitable varieties, and value as a livestock feed.
60. Dugard, Jean. La valeur alimentaire et industrielle du soja. Le Génie Civil 100(17): 419-420. April 23, 1932. 290.8 G29  
This is based in part on material from Farmers' Bulletins 1617, 1605 and 1520, and on M. R. Guin's article in Journal d'Agriculture Pratique, Dec. 12, and 19.  
The author takes up composition and food value of the soybean, products from the soy eaten by man, the use of the soy as forage, and industrial uses for the oil and cake.
61. East Indies (Dutch). Departement van landbouw, nijverheid en handel, Afdeeling landbouw. Kedelee. 195pp. Buitenzorg [1932] 60.3 Ea7  
Literatuur, pp. 173-174.  
Summaries of the papers contained in this volume are given in English, pp. 175-[196].  
Partial contents: Over de beteekenis van de sojaboon als handelsproduct, by D. F. Blokhuis en E. R. Von Liebenstein, pp. 5-31. (Eng. The commercial significance of the soybean, pp. 177-178); De voedingswaarde der sojaboon en enkele daaruit bereide specifiek Indische voedingsmiddelen, by W. F. Donath, pp. 139-173. (Eng. The food value of the soybean and some specifically East Indian articles of food prepared from them, pp. 193-195).  
Also published as the Kedelee or soybean number of Landbouw; Tijdschrift der Vereeniging van Landbouwconsulenten in Nederlandsch-Indie 7(9): 569-766. March 1932. 22.5 L23
62. Eastman, W. H. Exporters taking soy beans away from U. S. mills. Grain & Feed Jours. Consolidated 69(9): 432. Nov. 9, 1932. 298.8 G762  
Abstract of speech before the National Soybean Oil Manufacturers Association.  
The writer points out the higher price obtained for soybeans in the European than in the domestic market, and concludes that "unless there is a demand for the products at substantially higher price levels the domestic oil milling industry may be forced to close down and let the European mills crush our soy beans for us..."
63. Edmondson, J. B. Soy beans and permanent agriculture. Purdue Agr. 18(4): 63, 80. January 1924. 6 P97  
"By all counts, I believe the best program for the Indiana farmer today is to build on a four-year rotation of corn, soy beans, wheat and clover, both from the standpoint of profits and the future welfare of the soil." The uses for the crop and commercial market are brought out.

64. Etheridge, W. C., and Helm, C. A. Productive methods for soybeans in Missouri. Mo. Agr. Expt. Sta. Bull. 195, 32pp. Columbia. 1922.  
Partial contents: Ten reasons why soybeans are popular in Missouri, pp. 3-5; Superior varieties of soybeans for some of the important sections of the State, together with their descriptions and the time they require for maturing, pp. 5-16; How to harvest, thresh and store soybean seed, pp. 25-28; The usefulness of the soybean hay crop, p. 28; The value of soybeans in rotation with corn, wheat and clover, p. 32.
65. Evans, Arthur T., and Fowlds, Matthew. Soybeans in South Dakota. S. D. Agr. Expt. Sta. Bull. 193, pp. 317-324. Brookings, 1921.  
An account of the importance of the soybean, its uses, and its varieties. Yields of soybean varieties for seed are given, 1914-1920, and yields of soybeans for hay, 1915-1920.
66. Everyman's legume - the soybean. Dairy Farmer 20(5): 110, 123. March 1, 1922. 44.8 K56  
"For the renter who cannot wait for clover, for the man short of legume feeds and for those who expect to reduce their corn acreage, there is the soybean." Soybeans as a cash crop, and soybeans for feed and silage are briefly discussed.
67. Evvard, John M. Soybean's popularity ascending. Flour & Feed 35(1): 19. June 1934. 298.8 F66  
Increasing soybean production in Iowa and other states mentioned. Also in Grain & Feed Jours. Consolidated 72(12): 535. June 27, 1934. 298.8 G762
68. Fain, John R., and Vanatter, P. O. Soy beans and cowpeas. Ga. Agr. Col. Ext. Circ. 46, 8pp. Athens, 1917.  
The section on soybeans takes up briefly their history, description, uses for food and oil, for seeding in corn, for hay, for silage, and as a grazing crop for hogs, soil requirements, drought resistance, varieties, and methods of harvesting.  
At the end of the article there is a comparative analysis of soybean and cowpea grain and hay.
69. Farmers crushing their own beans. Orange Judd Farmer 71(14): 375. July 15, 1923. 6 Orl  
A new association "known as the Piatt County Cooperative Soy Bean Company, has just completed the building of an up-to-date, thirty-five thousand dollar crushing plant near Monticello, Illinois, and expects to handle a good share of the bumper soy bean crop which Central Illinois is now grooming for the late summer market, as well as handling the surplus beans which farmers do not find ready sale for in that locality."



70. Farver, Warner E. More soy-bean hints. Natl. Stockman and Farmer 43(9): 253-254. May 31, 1919. 6 N21  
Advantages of soybeans because of their suitability for late planting and the resistance of the hay crop to rain.
71. Ferris, E. B. Soy beans for south Mississippi. Prog. Farmer (Miss. Valley ed.) 38(8): 210. Feb. 24, 1923. 6 So81  
The writer finds that soybeans give better returns in this section than cowpeas. Varieties are discussed and methods of cultivation brought out.
72. Figure on a patch of soy beans. This crop has proven its worth in Illinois in recent years. Orange Judd Farmer 72(2): 36. Jan. 15, 1924. 6 Or1  
"This comparatively new crop is fast proving itself a valuable crop on the general purpose farms in Illinois, and if you have been losing money on oats, or have a larger acreage of oats than you knew what to do with, it might be worth while to look up something about soys before spring work comes on."
73. Flumberfelt, W. E. Soybeans, a link between agriculture and industry. Grain & Feed Jours. Consolidated 78(10): 428. May 26, 1937. 298.8 G762  
Abstract of address before Western Grain & Feed Dealers' Association.  
The methods of processing the beans are described. The writer concludes: "All must teach the farmer the values of soybean oil-meal, and tell him that 80% of this soybean is meal, that if he wants a high price for his soybeans he must help make a good market for the meal."
74. El frijol que se ha hecho famoso. Revista de Agricultura [Cuba] 20(4-5): 30-36. April-May 1937. 8 Ag88Re  
"Vertido al Castellano por Rafael Gutierrez Marin, traductor de la Secretaria de Agricultura."  
This article describes the soybean, its history in the United States, the advantages of planting it, its uses as oil and vegetable milk, its use in industry, and prospects for the future.
75. Gaskill, E. F. The soy bean. Mass. Agr. Col. Ext. Circ. 56, [3]pp. Amherst, 1918.  
Includes a brief discussion of soybean uses, and the advisability of growing the beans in Massachusetts.
76. Graber, L. F. Soy beans, a self fertilized seed crop on sandy soils. Hoard's Dairyman 59(11): 679, 691-692. April 2, 1920. 44.8 H65  
"Soy beans have produced in Northern Wisconsin as much as one hundred cold, grey, jingling dollars an acre and a cash income of from forty to sixty dollars an acre has not been, during the past year, by any means unusual and often these profits have accrued on land worth less than the crop itself..."

Soybeans as soil builders, harvesting the crop for seed, and the scarcity of soybean seed are brought out.

77. Granato, L. A soja. São Paulo Secretaria de Agricultura, Commercio e Obras Publicas, Boletim de Agricultura ser. 14, no. 3; pp. 159-167. March 1913. 9.2 Sa63

"Data are given regarding the botanical characteristics, the composition and food value, and the uses of the soy bean." - Expt. Sta. Rec. 29: 865. 1913.

78. Grantham, Arthur E. The soy bean - its promise as a farm crop. Pract. Farmer 116(4): 70-71. Feb. 15, 1920. 6 P88

The history and description of the soybean, its uses, its future as a permanent crop in our agriculture, its market value and its harvesting are included in this article.

79. Grantham, Arthur E. Soy beans. Del. Agr. Expt. Sta. Bull. 96, 39pp. Newark, 1912.

The adaptability of soybeans to Delaware conditions, methods for utilizing the beans, soybeans in the crop rotation, yields of seed and hay per acre for different varieties, harvesting and curing the hay and harvesting and threshing for seed, storage of the seed, soybeans as a source of oil and protein, and soybeans compared with cowpeas are discussed.

80. Gray, George Douglas. All about the soya bean in agriculture, industry and commerce; with an introductory chapter by James L. North. 140pp. London, John Bale, sons & Danielsson, ltd. 1936. 60.3 G79

Bibliography, pp. 136-137.

Contents. - Introduction. Ch. I. Introducing the soya bean, pp. 10-21; II. The soya bean plant and its cultivation, pp. 22-45; III. The soya bean as food, pp. 46-69; IV. Soya bean oil, pp. 70-92; V. Soya bean trade, pp. 93-110; VI. The soya bean in agriculture, pp. 111-119; Addenda, pp. 120-138.

Frequent reference is made to the United States in the text. The Addenda contains a list of the soybean products exhibited by the American Soybean Association, recipes and statistics. These statistics include the amount of imports of soybeans made by the United States; and tons of soybeans produced in the United States during 1933, 1934, and 1935.

81. Grove, Ernest W. Soybeans in the United States; recent trends and present economic status. U. S. Dept. Agr. Tech. Bull. 619, 31pp. Washington, D. C., 1938. 1 Ag84Te

Selected list of references, pp. 29-30.

This study includes the development of the soybean industry in the United States and the relation of the United States to the world market for soybeans, soybean production in the United States,



the amount of beans used for crushing, and the uses for the oil, and meal, the factors affecting the price of soybeans, the present economic position of the bean and its products.

There are the following tables: 1. Production of soybeans in specified countries, 1925-36; 2. Imports of soybeans, soybean oil, and soybean cake and meal, United States, 1912-36; 3. United States tariff rates on soybeans, soybean oil, and soybean cake or meal, 1913-37; 4. Soybeans: Acreage for hay, beans, and grazed or hogged-off, United States, 1924-37; 5. Soybean production, quantity crushed, exports, change in stocks, quantity used for feed or seed, and average farm price, 1924-37; 6. Factory consumption of soybean oil, by classes of products, 1931-36; 7. Factory production, net imports, stocks, and disappearance of crude soybean oil, 1922-36; 8. Production of soybean, cottonseed, and linseed oils in the United States, average 1928-32, annual 1933-36; 9. Production of high-protein feeds in the United States, average 1928-32, annual 1933-36; 10. Value of soybean oil and meal produced per bushel of soybeans, farm price, and spread between farm price and total value, United States, October 1933-September 1937; 11. Average price per pound of soybean oil, linseed oil, and cottonseed oil, in tank carlots, specified localities, by months, 1929-36; 12. Average price per ton of soybean meal, cottonseed meal, and linseed meal, bagged, specified markets, by months, 1929-36; 13. Total acreage, acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924-37; 14. Total acreage, acreage harvested for hay, acreage grazed or hogged off, acreage harvested for beans, yield per acre, and production of soybeans in the United States, and selected regions and States, 1924-37.

82. Growth of the soya bean industry in America and its effect on the Malayan copra and palm oil trade. *Malayan Agr. Jour.* 22(3): 141-142. March 1934. 22.5 F312

"If the importation of copra and oil palm products into the United States is restricted in order to encourage home production of oil-producing crops, it is not improbable that the demand for coconut and oil palm products in the United States will in the future tend to diminish."

83. Guard, Samuel R. Soybeans in a cornbelt rotation. *Breeder's Gaz.* 77(2, whole no. 1988): 67-68. Jan. 8, 1920. 49 B74

Describes methods used by William E. Riegel on the C. L. Meharry farm in Champaign, Illinois. Harvesting for hay and seed, yields, effect of soybeans on corn yield when they are planted in combination, and the dependence upon the hog market outlook of methods of harvesting corn and soybeans are mentioned.

84. Hackleman, J. C. Growing soybeans in Illinois. *Ill. Agr. Expt. Sta. Circ.* 255, 16pp. Urbana, 1922.

Includes directions for harvesting and threshing, and a description of the varieties of soybeans adapted to various uses.

85. Hackleman, J. C. La soja y sus multiples usos. La Hacienda 33(1): 6-9; (2): 53-55. January-February 1938. 6 H11

The author discusses the increasing soybean production in the United States, the reasons for it, the value of the soybean in crop rotations, its use as a soil improver, and harvesting for hay and seed. A table shows the numerous uses for the soybean and its oil and meal.

86. Hackleman, J. C., Sears, O. H., and Burlison, W. L. Soybean production in Illinois. Ill. Agr. Expt. Sta. Bull. 310, pp. 465-531. Urbana, 1928.

Literature cited, p. 531.

"With hundreds of farmers annually trying out soybeans for the first time, with the increased interest in the crop resulting from continued economic difficulties with the oat crop, and the threatened invasion of the corn borer, problems regarding the soybean are constantly coming up with renewed vigor. Farmers wish to know the various uses to which the new crop can be put, its adaptation to their sections of the state, and particularly urgent is the demand for recommendations regarding suitable varieties and the details of cultural practices.

"This bulletin is therefore issued principally to report the results of variety trials which have been under way on the University South Farm at Urbana for about twenty years and on the northern Illinois experiment field at DeKalb for five years. The most recent information available on other points of interest is also included in order that farmers and others may have a good basis for arriving at a correct evaluation of the crop." - p. 467.

An anonymous article based in large part on this bulletin is entitled "Harvesting and threshing soybeans." Amer. Thresherman 31(4): 9. August 1928. 58.8 Am32

87. Hall, F. H. Soybean and cowpea. N. Y. (State) Agr. Expt. Sta. Circ. 45, 6pp. Geneva, 1915.

Included in the paper are a description of the general character of the soybean, its uses and value, and yields and feeding value.

88. Heaton, E. B. Making the farm feed the cow. Orange Judd Farmer 67(20): 748-749. Nov. 15, 1919. 6 Or1

The author briefly sketches the history of the soybean, its value as human food, its use with corn for silage, and cultural methods.

89. Hedgson, Emory R. Ten lessons on soy beans and cow peas. Va. Agr. Col. Ext. Bull. 55, 26pp. Blacksburg, 1919. (Boys' and girls' agricultural and home economics club series)

Utilization of the crop, and profits from it; harvesting;



value and yield of seed; feeding value; use as human food and for oil and meal; and soybeans as hay, pasture, a soiling crop and ensilage are discussed in the lessons.

90. Herman, V. R. Soybeans and cowpeas for North Carolina. N. C. Agr. Expt. Sta. Bull. 241, 40pp. Raleigh and West Raleigh, 1919.

The section on soybeans contains information on the history of the soybean, the comparative feeding value of various hays including soybean hay, the production of soybeans for seed, soybeans as summer pasture, and soybeans as an improver of the soil. The last section contains a brief comparison of soybeans and cowpeas for seed and hay production.

91. Holman, R. L. A new variety of soybeans. Marshall county, Tennessee makes a hit with Laredo beans. Dairy Farmer 23(4): 13, 26-27. Feb. 15, 1925. 44.8 K56

Increased yields from the crop of this variety are brought out. Farmers who harvested a seed crop in 1924 formed the Laredo Bean Growers' Association for the pooling of their seed for sale when the demand comes.

92. Horvath, A. A. The soybean points the way to agricultural recovery. Sci. Monthly 43(1): 63-69. July 1936. 470 Sci23

"It seems evident that to-day the soybean is one of the most promising agricultural plants for an almost unlimited variety of industrial uses, most of them non-competing with existing domestic products, and as such offers the broadest outlook for making farming a paying proposition. The cultivation of soybeans as a cash crop has every chance to expand far beyond the existing commercial level, which will no doubt create numerous new industries and by this do its share in relieving unemployment. The soybean thus seems to point towards a practical and constructive way for many a crop which, through the lasting efforts of all concerned, may lead to the ultimate well-being of the farmer, the workman and the business man alike."

93. Houston, D. F. Cowpeas and soy beans. Hoard's Dairyman 53(15): 641. May 4, 1917. 44.8 H65

This is a brief summary by the Secretary of Agriculture of the value of soybeans for oil production and human food, and the shortage of supply.

94. Hughes, H. D., and Wilkins, F. S. Soy beans in Iowa. Iowa Agr. Expt. Sta. Circ. 65, [4]pp. Ames, 1920.

Contains a brief section on the importance of soybeans, and one on harvesting them.

95. Hulbert, H. W. Soy bean meal. Flour & Feed 31(12): 27. May 1931. 298.8 F66

The uses of the soybean in the United States, its high protein content, and its great value as a hog feed, are among the matters taken up.

96. Hulbert, H. W., and Spence, H. L. Soybean production in Idaho. Idaho Agr. Expt. Sta. Bull. 218, 13pp. Moscow, 1935.  
History of the soybean, p. 4; Varieties for northern Idaho, pp. 4-6; Utilization of soybeans, pp. 7-8; Soybean oil, pp. 8-9; Feeding value of soybeans, pp. 9-10; Soybean hay, p. 13; Harvesting for seed, p. 13.
97. International institute of agriculture. Le soja dans le monde. 282pp. Rome, [Imprimerie de la Chambre des députés - Charles Colombo], 1936. 60.3 In82S  
Bibliography, pp. 276-282.  
Part B. takes up the various uses of the soybean as human food, uses for the oil, use of the bean in the feeding of domestic animals, and its use as a manure. Part C. discusses commerce in the soybean and its products, soybean production in various countries including the United States, the economic importance of soy culture in the United States, sale prices of soybeans, 1930-1935, and net cost.
98. Invading bean: soya crops exported from America give Japanese case of jitters. Lit. Digest 122(6, whole no. 2416): 14-15. Aug. 8, 1936. 110 L  
The increase in American production of soybeans and their exportation at lower prices than the Manchukuo product are discussed. The uses for the crop in American industry are brought out, and it is said that "Manchukuo's production has dropped from 5,227,000 tons in 1931 to 3,822,000 tons in the last twelvemonth; and even tho America's invasion of the world market may be, as the Japanese hope, only temporary, it has shaken them terribly."
99. Iowa farmers and the soy bean. Growers of soy beans are finding out how best to grow and use the crop. Wallaces' Farmer 48(15): 581. Apr. 13, 1923. 6 W15  
This is a report of the experiences of farmers with soybeans. Uses for the crop are brought out.
100. Itié, G. Le soja, sa culture, son avenir. L'Agriculture Pratique des Pays Chauds. Bulletin du Jardin Colonial 10(82): 37-49; (83): 137-144; (84): 231-246; (85): 305-307; (93): 485-493; 11(94): 55-61. January-April, December 1910; January 1911. 26 Ag81  
Includes (1st installment) the history of the crop in various countries, (2nd) a chemical analysis of various parts of the soybean plant, (3rd and 4th) harvesting for green fodder and seed and threshing, and (5th and 6th) soybeans in mixtures and in the crop rotation. Yields are given, based in part upon figures given by United States experiment stations.
101. Itskov, ... Mekhanizatsiia i agrotekhnika soi... 46pp. [Moskva] 1931. 60.3 It6  
At head of title: Itskov, Ageev, Vainman.



The mechanization and agrotechny of soybeans. Study includes material on the harvesting of the beans with combines, and the storage of the crop. Reference is made to work done in this field in the United States and other countries.

102. Jackson, A. D. Soybeans not adapted to southwestern climate. Grain & Feed Jours. Consolidated 76(6): 238. March 24, 1936. 298.8 G762

"The Corsicana Soybean Conference, sponsored by the East Texas Chamber of Commerce, was a most important meeting and one calculated to gradually develop the soybean as one of the crops to substitute or replace acreage released from cotton. The sense of the conference was universally, that in the promotion of this crop, the procedure should avoid a mushroom growth and should follow along the lines that would permit of sound development...

"Dr. E. B. Reynolds, of the Texas Experiment Station presented results to the conference, showing that, over a period of years, the production of soybeans at the several substations has not been high...

"It should be borne in mind that there is abundant authoritative information from the Experiment Stations here in Texas to show that soybeans will not yield profitable crops year in and year out..."

103. Jamieson, George S. Vegetable fats and oils. 444pp. New York, The Chemical catalog co., inc., 1932. 307 J24

Ch. IV. Drying Oils, pp. 225-285, includes a section on soybean oil, pp. 261-269. In it are brought out the history of the soybean, yields in various countries, importance and production in the United States, harvesting and storage of the beans, methods of manufacture of the oil and meal in the United States, the chemical characteristics of soybeans and soybean oil, and the uses of soybean oil.

References included in the text; those for this passage are given on pp. 268-269.

Ch. VI. Methods, pp. 321-407, describes, pp. 397-398, the method of refining crude soybean oil.

104. Jardine, W. M. The year in agriculture. The Secretary's report to the President. U. S. Dept. Agr. Yearbook, 1926: 1-120. Washington, D. C., 1927. 1 Ag84Y

Soybean acreage and seed value, p. 66.

105. Jeter, F. H. Soy beans - a valuable crop. Amer. Fertilizer 56(11): 81-82. June 3, 1922. 57.8 Am3

Briefly discusses the growing importance of soybeans, harvesting the beans, and the average yield to be expected.

106. Johnson, E. F. Commercial growing of soybeans. Purdue Agr. 11(1): 17-21, 45. October 1916. 6 P97

Methods of handling and harvesting the crop on the Johnson Seed Farms at Stryker, Ohio, are described.

107. Johnson, E. F. Keeping up with soybeans. Grain & Feed Jours. Consolidated 76(6): 243. March 24, 1936. 298.8 G762  
The rapid increase in the production of soybeans in this country, the soybean market, prices and uses for the crop are outlined.
108. Johnson, E. F. Soybean acreage expanding. Grain & Feed Jours. Consolidated 74(3): 112. Feb. 13, 1935. 298.8 G762  
"There is every indication now of a decided increase in the soybean acreage next year. In those sections, ravaged by drouth and chinch bugs, where corn was almost a total failure, yields of soybeans from 20 to 40 bus. per acre were common. Present prices, around a dollar per bushel to the grower, together with the success of the crop under adverse conditions, will result in a large increase in many sections."
109. Johnston, Ralph E. Soybeans in South Dakota. Breeder's Gaz. 80 (23, whole no. 2087): 846-847. Dec. 8, 1921. 49 B74  
Describes experiences with soybeans related by people at the first annual soybean day in Clark County, South Dakota.
110. Johnston, Ralph E. Soybeans in South Dakota. S. Dak. Agr. Col. Ext. Leaflet 27, 4pp. [Brookings] 1923.  
Uses of soybeans, threshing of the crop, and varieties for various uses, are briefly mentioned.  
This is also printed under title "Grow soybeans in South Dakota." Dakota Farmer 44(6): 291. March 15, 1924. 6 D14
111. Jordan, Sam. Corn in Missouri; also soybeans and cowpeas. Mo. State Bd. Agr. Monthly Bull. v. 19, no. 11, 47pp. Jefferson City, November 1921.  
"Soybeans - 40 questions and answers", pp. 37-47, has some material economic in character.  
The same section, with a few minor changes in wording appears in Mo. State Bd. Agr. Monthly Bull. 15(6): 20-28. Columbia. June 1917.
112. Kaltenbach, D., and Legros, J. Soya: selection, classification of varieties, varieties cultivated in various countries. Internatl. Inst. Agr. [Rome] Monthly Bull. Sci. and Pract. Agr. 27(4): 117T-149T; (5): 165T-189T; (6): 216T-233T; (8): 281T-297T. April-June, August 1936. 241 In82  
In the first and second installments of this study, pp. 128T-149T; 165T-175T, there is a discussion of the varieties cultivated in the United States, with attention to the acreage of soybeans in the United States, the uses of the crop, and the characteristics of the varieties cultivated, as well as the varieties cultivated in each of the chief soy producing states.  
Tables include "Yields and utilisation of the principal soya



varieties cultivated in Massachusetts"; p. 167T, "Seed production of the principal soya varieties cultivated in Ohio (in bushels per acre)", p. 168T, "Production (in bushels per acre) of soya varieties, studied at the Experiment Station of Delta, Stoneville, compared with 5 Standard varieties (in 1934)", p. 170T.

113. Kansas Agricultural experiment station, Farm department, Manhattan. Soy-beans. Kans. Agr. Expt. Sta. Bull. 99, pp. 20-22. Manhattan, Sept. 25, 1899. (Press Bull. 46)  
Bulletin 99 is a reprint of Press Bulletins 35-70.  
Contains method and cost of harvesting and cost of production of 60 acres of soybeans on the College Farm.
114. Kempner, Adolph. The soybean (soja max). Grain & Feed Jours. Consolidated 74(1): 20-21. Jan. 9, 1935. 298.8 G762  
"In the map, tabulations, and text herewith the Rosenbaum Grain Corporation has assembled the latest data on production, exports, uses, varieties and salient facts about that coming crop, the soybean.  
"The compiler, Adolph Kempner, with clear vision, sees in the future a material increase in demand for human consumption."
115. Kempski, Karl E. Die sojabohne: geschichte, kultur und verwendung unter besonderer berücksichtigung der verhältnisse in Niederländisch-Indien. 88pp. Berlin, Paul Parey, 1923. 60.3 K32  
"Literaturverzeichnis", pp. 76-80.  
Includes material on the history of the soybean, its culture, prices, and utilization in the United States, and utilization of soybeans and various food preparations made from them in various countries.
116. Kennedy, Carl N. Getting the facts about soy beans. Wallaces' Farmer 45(53): 2876. Dec. 31, 1920. 6 W15  
It is pointed out that there is a good deal of misrepresentation in the varieties of seeds, and that "if soy beans are to become a commercial crop in Iowa, some of the fundamental work will be to find out which types are best adapted for the particular purposes for which they are desired. Very likely then they will give better satisfaction than is possible under present conditions."
117. Kennedy, L. W. The soybean. A new American. Purdue Agr. 29(9): 83, 86. June 1935. 6 P97  
The writer traces the history of the soybean in the United States, and outlines the industrial and food uses which have been found for it.
118. Khankhoje, Pandurang. El frijol soya. El Campesino 1(7): 14-15. March 1936. 8 C152  
Contains a section on the importance and utilization of the soybean.

119. Kiesselbach, T. A. Soy beans. Nebr. Agr. Expt. Sta. Bull. 166, 16pp. Lincoln, 1918.

The following sections are included in this bulletin: Uses; food values; composition; adaptation and varieties; relative yields of soy beans and cereal crops; harvesting and threshing; soy beans as a forage crop; how to use soy beans for human food. Recipes are given in this last section.

120. Kiesselbach, T. A. Soy beans and cowpeas. Nebr. Agr. Expt. Sta. Bull. 150, 31pp. Lincoln, 1915.

The bulletin includes the adaptation and uses of soybeans and cowpeas for Nebraska conditions, their composition and feeding value, yields in other states, varieties tested and yields at the Nebraska Experiment Station, their use for hay and for silage, their yield compared with grain crops at the Nebraska Experiment Station, their use as soil improvers, and their place in rotation, harvesting, threshing and storing.

121. Kiltz, B. F. Soybeans for Oklahoma. Okla. Agr. Expt. Sta. Circ. 77, 14pp. Stillwater, 1930.

The writer discusses in part the importance of soybeans for Oklahoma, their adaptation to soil conditions in the State, the varieties of soybean and their characteristics, harvesting the hay, and harvesting seed, and the uses of the crop.

122. King, B. M. The soybean crop in Missouri. Mo. Agr. Expt. Sta. Circ. 174, 15pp. Columbia, 1924.

Includes discussion of the advantages of soybeans grown in mixtures with other crops, the harvesting of soybeans for hay and seed, the place of soybeans in the crop rotation, their effect upon the yield of wheat, the cost of producing soybeans and the feed value of soybean hay.

123. Kinney, E. J. Soybean project, junior 4-H clubs. Ky. Agr. Col. Ext. Circ. 94, rev., 14pp. Lexington, 1930.

Reference, p. 14.

History of the soybean, its increasing importance in the United States, methods of harvesting for hay and seed, and threshing methods are included.

124. Kinney, E. J. Soybeans and cowpeas in Kentucky. Ky. Agr. Col. Ext. Circ. 292, 25pp. Lexington, 1937.

Includes discussion of the importance of soybeans and cowpeas in Kentucky, varieties of soybeans and cowpeas for Kentucky, the harvesting of soybean and cowpea seed, threshing, storing of the seed, yields of soybean and cowpea hay, and hay mixtures including soybeans and cowpeas.



125. Kornfeld, Arnold. Die Ölbohne oder soja. 32pp. Hamburg, F. W. Thaden [1935]. ([Neues] handbuch der tropischen agrikultur... Ergänzung.) 60.3 H84  
Includes, pp. 1-4; material on the history of the soybean and its present day extension in various countries; the bean in crop rotation in Europe and the United States, pp. 18-19; Pests of the bean, pp. 19-22, and diseases, pp. 22-24, in various countries; the uses of the soybean, pp. 24-32.  
Schriftwerk, p. 32.
126. L., W. H. The soybean - a crop with a future. Ohio Farmer 150(15, whole no. 3891): 354. Oct. 7, 1922. 6 Oh3  
"The soybean has become definitely established as a commercial crop in the Middle West. It promises to rank with alfalfa as a hay crop; it will give clover a race as a soil-improving crop; it has already proven its value as a supplement to corn for both silage and hogging down purposes. As a cash crop it has great possibilities since the oil which it yields is in great demand both for food and for use in the arts. Either the raw bean or the resultant cake left after the oil is extracted or expressed has a high value as a protein supplement when combined with the proper mineral mixture.  
"These are facts which were gleaned at the recent Soybean Field Day at the Ohio Experiment Station..."
127. Lacey, James. From sandburs to soy beans. Hoard's Dairyman 62(13): 363. Oct. 14, 1921. 44.8 H65  
"A few fields which have really never produced anything but sandburs are maturing a crop of soys that will help to pay the taxes for years to come..."
128. Landis, Harry A. Soybeans and their culture. Ohio Farmer 145(21, whole no. 3767): 872-873. May 22, 1920. 6 Oh3  
The importance of soybeans, their climatic adaptations in the United States, and harvesting and threshing are described. A diagram shows the numerous uses of the beans.
129. Landon, I. K. Soy beans as a cash crop in eastern Kansas. Kans. State Bd. Agr. Bien. Rept. (1919-1920) 27: 250-254. Topeka, 1931.  
"In brief, the advantages of the soy bean as a cash crop are that it produced a satisfactory acre return and does so with reasonable consistency, it and its by-products are protected by the tariff from foreign competition, the straw is a valuable stock feed and the fertility added to the soil by the inoculated soy beans enables the farmer to produce larger crops on that field the next year." Methods of handling the beans are included.
130. Langenberg, Johannes Wilhelm Hermann. Die bedeutung der sojabohne in der weltwirtschaft. 103pp. Pinneberg bei Hamburg, Buchdruckerei A. Beig, 1929. 60.3 L26

Inaug.-diss.- Köln.

"Literaturübersicht", pp. 5-6.

Part 1. discusses the culture and production of the soybean, including mention of the chief producing countries and, pp. 26-29, soybean culture in the United States, its history and amount of production in the chief producing states.

Part 2. takes up the soybean in foreign trade, with particular reference, however, to the Manchurian industry and its exports to Asia and Europe.

Part 3. describes the utilization of the soybean, and its production and quantities of exports and imports of soy meal in individual countries including the United States. A table giving the oil cake imports into the United States 1910-1926 is offered, pp. 87-88. The soybean in human nutrition is also taken up, with description of the attempts to establish it as a means of subsistence in Europe and the United States.

131. Layson, S. V. How to grow soy beans. Dairy Farmer 19(9): 264-265. May 1, 1921. 44.8 K56

Although concerned chiefly with cultural methods, this article brings out some of the uses for soybeans on the farm, their yield and the price of seed.

132. Lechartier, G. Étude sur le soja hispida. Annales de la Science Agronomique Française et Étrangère 8: 380-396. 1902-1903. (2e Série- Huitième Année. 1902-03. Tome 1) 14 An75

The use of the soybean and its harvesting as green forage and as seed, and the composition of the bean are briefly taken up, among other things.

133. Lewis, R. D. Soybeans for Pennsylvania. Penn State Farmer 14(7): 250, 255-256. April 1921. 276.8 P38

The growing importance of soybeans in Pennsylvania, uses of the crop, and best seed-yielding varieties are discussed.

134. "Little honorable plant". Time 28(15): 76, 78, 80. Oct. 12, 1936.

The value of the soybean crop to the United States, the increasing acreage planted in soybeans, their uses as food, and in the factory, and the utilization of the beans in the Ford plant are discussed.

A Spanish translation of this by Prof. Miguel A. Valdivia, under the title "La pequeña planta honorable" was printed in the Revista de Agricultura [Cuba] 20(2): 67-69. February 1937. 8 Ag88Re

135. Li-Yu-Ying, and Grandvoinnet, L. Le soja: sa culture, ses usages alimentaires, thérapeutiques, agricoles et industriels; traduction revue et augmentée de l'édition chinoise publiée par les soins de la Société biologique d'extrême-Orient. 150pp. Paris, Augustin Challamel, 1912. 60.3 L61



This is a study of the soybean which includes material on its origin and history, its uses as food for human beings and animals, food products made from it, and its industrial uses.

136. Lloyd, Walter H. Let George do it and he did! Briggs made national soybean field day a real success. Ohio Farmer 152(13, whole no. 3943): 294. Sept. 29, 1923. 6 Oh3

This is an account of talks given at the National Soybean Field Day at the University of Wisconsin.

137. Lloyd, Walter H. Possibilities of the soybean. Ohio Farmer 148(12, whole no. 3836): 255, 275. Sept. 17, 1921. 6 Oh3

This is a description of the demonstration given by the Johnson seed farms in Williams County, Ohio, on the possibilities of the crop.

138. Lothrop, Leon. Soya beans. North-West Farmer 51(18): 8-9, 29. October 1932. 7 N83

The writer discusses the value and importance of soybeans in various countries, their uses, amount of production in the United States, the possibilities of the crop in Western Canada, and the prices which might be expected if they do grow them.

139. McArthur, William. Ten years of soybean experience. This farmer grew soys with corn for silage, and alone for seed and hay. Wallaces' Farmer 52(17): 656. Apr. 29, 1927. 6 W15

Harvesting the crop is briefly discussed.

140. McClelland, C. K. Speaking of soy beans. 5pp., processed. A.E. Pam. Coll. (Soybeans)

"From the Arkansas Gazette Magazine, Little Rock, Sunday, Mar. 1, 1936."

"...What we need in Arkansas is a larger planting of soy beans that we may feed the cattle and ourselves, as well as the horses, at the same time helping to keep the mills running and keeping some of the money now used for imports at home."

141. McGuire, Ray F. Soybean values. 15pp. Cedar Rapids, Iowa, Soybean production advisory board [1934]. 60.3 M17

"Literature cited", p. 15.

Values as a farm crop, pp. 4-5, Commercial possibilities, p. 5, Valuable human food, pp. 5-6, Modern method of producing oil and oil meal, p. 6, Utilization of soybean oil, pp. 6-8, Utilization of soybean oil meal, pp. 8-9, Soybean flour, p. 10, Imports, exports and the tariff, p. 10, Marketing soybeans, oil and meal, pp. 10-11, Potential markets, p. 11, Production last year (in the United States), pp. 11-14.

Graphs show the domestic production of soybean oil, 1927-1932, and the increasing seed production in Iowa 1925-1933, and a map shows the principal soybean producing counties in Iowa.



142. McRostie, G. P., Hamilton, R. I., Dimmock, F., and Clark, S. E.  
Soybeans in Canada. Canada Dept. Agr. Pamphlet (n.s.) 93, 11pp.  
Ottawa, 1928. 7 C16Pa  
Harvesting, p. 5; uses of soybeans, pp. 7-8.
143. Malin, D. F. Soy beans as a corn substitute. Wallaces' Farmer 47(4):  
99. Jan. 27, 1922. 6 W15  
"The soy bean offers excellent possibilities to corn belt farmers, not only as a substitute for part of the corn but also as a supplement for part of the corn planted in 1922."
144. Manchurian repercussions in the oil markets. Chem. Markets 30(4):  
341-343. April 1932. 381 C426  
"To the Far East the soybean is essentially a food. Industrial uses are of a secondary consideration. To us contrarywise industrial uses are of greater comparative consideration...  
"The chemical and allied industries are interested therefore, in what effect events in Manchuria will have on supplies and prices..."  
Our consumption of soybeans is given, and the hearings of 1929 and 1930 for the Smoot-Hawley Tariff relating to soybean oil, and the Tariff Commission's report to Congress on costs of production and transportation of several important oils are summarized.
145. Mansfield, O. W. Growing soybeans with corn. Purdue Agr. 11(7):  
22, 53. April 1917. 6 P97  
Part of this article is devoted to harvesting methods and the results of feeding the ensilage to beef cattle and dairy cows.
146. Matenaers, F. F. Die sojabohne, ihre kultur und wirtschaftliche bedeutung. Mitteilungen der Deutschen Landwirtschafts-Gesellschaft 29(40): 549-553. Oct. 3, 1914. 18 D48M  
Includes discussion of the extent of soybean culture in the United States, composition and yield in the United States, and uses in animal feeding. Harvesting methods are touched upon.
147. Mathews, I. J. More soybean questions. Ohio Farmer 143(22, whole no. 3716): 851. May 31, 1919. 6 Oh3  
A few of the questions are on the profitability of soybeans, the market for them, the advisability of using them as a green manure crop, and the permanence of soybean popularity.
148. Megee, C. R. Soy beans. Mich. Agr. Expt. Sta. Spec. Bull. 100, 11pp. East Lansing, 1920.  
The value and advantages of soybeans are brought out, pp. 3-5, and harvesting methods, 10-11.  
This bulletin is printed in Mich. State Bd. Agr. Ann. Rept. (1919/1920) 59: 546-554. Lansing, Wynkoop Hallenbeck Crawford Co., State Printers, 1921.

149. Meharry, C. L. Eight years growing soy beans. This crop destined to become as staple as oats. Orange Judd Farmer 62(7): 1, 6-7. Feb. 17, 1917. 6 Orl

The author feels that the crop is a valuable one both from the financial and the soil fertility standpoints, and describes his experiences in growing and harvesting the soybean crop.

150. Metropolitan life insurance company, Policyholders' service bureau. A report on soy beans and soy bean oilmeal. 15pp., processed. New York, 1925. Pam. Coll. 60.3 M

"The purpose of this report is to compile the available information on the use of soybean oilmeal in the United States." - Prefatory note.

Contents. - Introduction, p. 1; Uses of the soy bean, p. 2; Commercial importance of soybean oil and meal, p. 3; Method of oil extraction, pp. 4-5; History of the soybean in the United States, pp. 6-9; Present uses of soybean oilmeal cake, pp. 9-11; Soybean meal as a fertilizer, pp. 11-12; Production of soybeans in the United States, p. 13; Estimates of recent production [in Illinois and in the United States], pp. 14-15.

151. Mighell, Albert, Hughes, H. D., and Wilkins, F. S. Soybeans in Iowa farming. Iowa Agr. Expt. Sta. Bull. 309, pp. 147-206. Ames, 1934.

The following subjects are taken up: Soybeans as a concentrate, for hay and as an emergency crop; the expansion of the soybean acreage in Iowa; the reasons for which Iowa farmers may be interested in soybeans; recommended varieties of soybeans; harvesting the beans as seed and as hay; the time element in soybean production; and the adjusting of plans in response to changes in prices and costs of production.

152. Mills, Zeller R. Commercial growing of soybeans in Iowa. 15pp. Cedar Rapids, Iowa, Soybean production advisory board co-operating with Soybean products, inc. [1934]. (Farmers' bulletin no. 1, 1934) 60.39 So9 no. 1

"The information presented in this bulletin has been compiled and approved by members of the Advisory Board because of their belief that improvement in cultural methods will prove an important factor in the development of commercial soybean production in Iowa through increasing both the acre-yields and the net returns per acre."

Harvesting and threshing are taken up, pp. 11-13; storing the beans, p. 13; yields per acre, p. 13; factors affecting price of soybeans, pp. 13-14; marketing the crop, p. 14; need for processing soybeans, pp. 14-15; the work of Soybean Products, inc., p. 15.

153. Minns, Edward R. Soy beans. N. Y. Dept. Agr. Bull. 87, pp. 2938-2944. Albany, September 1916. 2 N482



The writer discusses the history of the soybean, its utility, and methods used in growing soybeans as a soiling crop, for silage, for hay, for pasture, for seed and grain, and for soil improvement.

154. Missouri. State Board of agriculture. Cowpeas and soy beans. Mo. State Bd. Agr. Monthly Bull. 12(5): 3-48. May 1914. 2 M69B  
Introduction, by W. L. Nelson, pp. 3-7, discusses the increased favor of soybeans and cowpeas on the farm.  
Soy beans and cowpeas, by A. T. Wiancko, M. L. Fisher, and C. O. Cromer, pp. 8-27, includes a brief history of the crops, their uses and value, and harvesting and threshing methods. This is a reprint of Ind. Agr. Expt. Sta. Bull. 172, pp. 421-438. Lafayette, 1914. (vol. 17)
155. Mistakes and successes with soybeans. Prog. Farmer (Miss. Valley ed.) 41(6): 462. April 17, 1926. 6 So81  
This is a group of letters from readers on their experiences with soybeans. Two cite financial returns from soybeans, and one relates the writer's experiences in feeding them to chickens and pigs.
156. Mooers, Charles A. The soy bean. A comparison with the cowpea. Tenn. Agr. Expt. Sta. Bull. 82, pp. 75-104. Knoxville, 1908.  
"The data presented in the pages which follow indicate that under Tennessee conditions each crop has a place which the other can not take..."
157. Mooers, Charles A. The soy-bean as a farm crop. Amer. Soc. Agron. Proc. (1907-1909) 1: 153-158. [Washington, D. C.] 1910. 4 Am34P  
The author finds that "after 30 or more years of...trial the melancholy truth must be admitted that the American farmer has not taken kindly to the soy bean, at least to the extent of its becoming as a matter of fact an important farm crop." He considers the reasons for this, compares the value of soybeans with cowpeas, and points out the favorable outlook for the soybean.
158. Moore, R. A., and Delwiche, E. J. Soybeans - a crop worth growing. Wis. Agr. Expt. Sta. Bull. 289, 16pp. Madison, 1918.  
The writers discuss the soils adapted to soybeans, the uses for soybeans, the best varieties for Wisconsin, the growing of the crop, and harvesting for hay, for silage and for seed.
159. Moore, R. A., Delwiche, E. J., and Briggs, G. M. Soybeans - a good legume crop borrowed from the Orient. Wis. Agr. Expt. Sta. Bull. 375, 32pp. Madison, 1925; Rev. 1929.  
In addition to methods of cultivation, the importance and uses of soybeans, harvesting and varieties, are brought out. The uses of soybeans recommended for northern, central and southern Wisconsin are given in tabular form, as well as the average yield of soybeans at Madison 1917-24.



160. Moore, R. A., and Delwiche, E. J. Soy beans - an important Wisconsin crop. Wis. Agr. Expt. Sta. Bull. 236, 20pp. Madison, 1914.

"The object of this bulletin is to discuss briefly the cultural requirements of the soy bean, to furnish information in regard to the different uses to which the crop may be put, and to show the results secured with the pedigree varieties developed by the College especially for Wisconsin conditions."

A brief history of the soybean is also included.

161. Moorhouse, L. A. Cowpeas and soy beans. Okla. Agr. Expt. Sta. Bull. 74, 22pp. Stillwater, 1907.

Adaptations of the crops to Oklahoma conditions, their place in the rotation, their importance to the stockman farmer, their chemical composition, and harvesting methods and machinery are described, among other things.

162. Morris, Curtis. Soy bean conference at Corsicana. East Texas Chamber Com. East Texas 10(4): 9, 21. January 1936. 6 Ea73

A description of plans for the East Texas Soy Bean Conference at Corsicana, January 14-15, sponsored by the East Texas Chamber of Commerce.

163. Morris, H. T. Story of soybeans. Flour & Feed 34(11): 9; (12): 9. April-May 1934. 298.8 F66

The writer outlines the history of the soybean in the United States, and in Illinois, the uses for soybeans in animal feeding, and the system of manufacturing oil meal used at the A. E. Staley Manufacturing Company, Decatur, Ill. He quotes A. A. Horvath on the food uses of the soybean.

164. Morse, William Joseph. Growing soy beans as a cash crop. Will it pay to produce soy beans for oil and meal in the Corn belt? Wallaces' Farmer 48(5): 155, 161. Feb. 2, 1923. 6 W15

"The large importations of soy beans, soy bean oil and soy bean cake into the United States the past few years, and the enormous market demands for vegetable oils and oil meals seem to indicate a ready market for soy bean products. The possibilities of developing a manufacturing industry with American grown seed appear excellent, especially in the central states. Many soy bean enthusiasts believe that the soy bean is destined to become one of the major field crops in the United States..."

165. Morse, William Joseph. Hokubei Gasshiu-goku ni okeru daizu no seisan narabini riyo no genkyo (The present situation of the soybean in the United States) [22pp.?] [Tokyo?] Soybean research institute, 1930. J 60.3 M83

"This is the lecture on soybeans given by Mr. Morse when he went to Japan in 1930. Translated into Japanese by Yoshi Takamori." - Typed slip pasted in book, signed S. K.

166. Morse, William Joseph, and Hendrick, H. B. Illustrated lecture on soy beans. 16pp. Washington, Govt. print. off., 1919. (U. S. Dept. of Agriculture, Syllabus 35) 1 Ex6Fa no. 35  
Contribution from the States Relation Service...in cooperation with the Bureau of Plant Industry.  
There are brought out, among other things, the increasing importance of the soybean in the United States, its feeding value for sheep and hogs, its use as pasture, silage and hay, value of planting the beans for seed and for oil, use of the meal as a fertilizer, soybeans and meal as human food, the place of the bean in the cropping system, harvesting and storing, and value of the crop as compared with cowpeas.
167. Morse, William Joseph, and Cartter, J. L. Improvement in soybeans. U. S. Dept. Agr. Yearbook, 1937: 1154-1189. Washington, D. C., 1937. 1 Ag84Y  
Selected references on genetics of the soybean, pp. 1181-1184.  
Although mainly concerned with breeding methods for soybeans, the article discusses as well the history of the bean, its distribution and production throughout the world, and its utilization.  
An outline showing the diversity of uses for soybean products is given on p. 1160.  
This article is summarized in this same issue of the Yearbook, pp. 154-155.
168. Morse, William Joseph. Soybean hay and seed production. U. S. Dept. Agr. Farmers' Bull. 1605, 13pp. Washington, D. C., October 1929. 1 Ag84B  
"This bulletin supersedes Farmers' Bulletin 886, Harvesting Soy-Bean Seed."  
Methods of harvesting and handling the soybean crop are discussed, with brief reference to their grading and marketing.
169. Morse, William Joseph. Soy bean in Manchuria. Rural New Yorker 79(4595): 1208. July 17, 1920. 6 R88  
This is a brief discussion of the history of the soybean in Manchuria and the extent to which it is planted in the United States. The article is a reply to an editorial in the Rural New-Yorker 79(4586): 948. May 15, 1920.
170. Morse, William Joseph. The soy-bean industry in the United States. U. S. Dept. Agr. Yearbook 1917: 101-111. Washington, D. C., 1918. 1 Ag84Y  
The writer treats of the early history of the soybean industry, the importance and uses of soybeans in the United States, and the possibilities of the soybean industry in the United States.  
Also published as Dept. Separate 740.  
A translation of this appears under the title "La industria del soy bean en los Estados Unidos" in Revista de Agricultura, Comercio y Trabajo (Cuba) 4(3): 521-524. March 1921. 8 Ag88Re



171. Morse, William Joseph. Soy-bean output increasing in United States. U. S. Dept. Agr. Yearbook. 1926: 671-673. Washington, D. C., 1927. 1 Ag84Y

"In the last decade the soy bean has advanced from a position of minor to one of major importance. Previously soy beans were grown only occasionally, usually as a substitute crop when clover or some other crop failed. At the present time the plant is grown regularly for hay, grain, and pasture, and with corn as silage."

172. Morse, William Joseph. Soybean varieties and their utilization. Assoc. South. Agr. Workers Proc. (1936) 37: 64-65, processed. [Atlanta, Ga., 1937] 4 C82

Abstract of paper.

Describes trends in soybean production in the United States, the commercial uses of the bean, variety experiments and their value.

173. Morse, William Joseph. Soy-bean varieties newly developed for U. S. farms. U. S. Dept. Agr. Yearbook 1926: 676-679. Washington, D. C., 1927. 1 Ag84Y

The writer points out that in the past twenty years more than 1000 varieties of soybeans have been introduced into the United States. A table shows "Value of seed and hay of the principal new soy-bean varieties introduced and developed by the United States Department of agriculture" (based on yields in 1924).

174. Morse, William Joseph. Soy beans: culture and varieties. U. S. Dept. Agr. Farmers' Bull. 1520, 34pp. Washington, D. C. Issued April 1927. 1 Ag84F

Includes a brief discussion of the history of the soybean, and takes up among other things, its climatic adaptations, the varieties recommended for different areas, and the growing of soybeans in mixtures.

Supersedes Morse, W. J. The Soy Bean; Its Culture and Uses. U. S. Dept. Agr. Farmers' Bull. 973, 32pp. Washington, D. C. July 1918.

175. Morse, William Joseph. Soybeans now a major crop in United States; few grown before 1898. U. S. Dept. Agr. Yearbook. 1933: 198-205. Washington, D. C., 1933. 1 Ag84Y

Traces the increase in knowledge of variety adaptation of soybeans, the investigation of variety utilization, the soybean oil and meal industry in the United States, the growing use of soybean oil, soybeans as human food, and the export of soybeans from the United States since 1931.

176. Mortimer, G. B. If winter kills your hay. Hoard's Dairyman 74(8): 401, 425. April 25, 1929. 44.8 H65

The advantages of soybeans over other crops, cost of the seed and expected yields of the crop are briefly touched upon.



177. Moscow. Nauchno-issledovatel'skii institut soi i spetsial'nykh kul'tur. K uborke urozhaia soi i nov'ikh kul'tur. 89pp. Moskva, 1932. (Bulletin no. 1) 60.39 M85

Includes papers on the following subjects: Inspection of soybean acreage as a means of obtaining higher yields, by V. I. Geimer, pp. 22-28; estimation of the soybean crop, by N. Luk'ianov, pp. 28-34; methods of harvesting soybeans, by G. S. Bardin, pp. 34-37; the drying and storing of soybean seed, by M. Dunin and G. A. Val'dman, pp. 56-61; the soybean for pasture, by N. A. Lebedev, pp. 70-73; the soybean for hay and forage, by N. A. Lebedev, pp. 73-77.

178. Myer, D. S. Why not grow soybeans? An easily grown legume that has a great future on Ohio farms. Ohio Farmer 147(17, whole no. 3815): 567. Apr. 23, 1921. 6 Oh3

The place of soybeans in the Ohio farming systems, the reasons why the soybean acreage has increased rather slowly, and the harvesting experience of P. Lewis Mark of Franklin County, Ohio, are briefly spoken of.

179. Need transit on soy beans. Grain Dealers Jour. 63(4): 243. Aug. 25, 1929. 298.8 G76

"Soy beans are becoming an important factor in the grain and feed trade and should be accorded the full privileges of grain in all freight rate and privilege schedules according to representatives of the grain and feed trade who appeared before a hearing of the Central Freight Ass'n held in Chicago August 20...

"Speakers told of the rapid development of the bean industry and emphasized that the movement of the beans for seed was a very small part of the shipments at the present time..." Brief comments by various speakers follow.

180. Nelson, Martin. Soy beans. Ark. Agr. Col. Ext. Circ. 167, 21pp. Little Rock, 1924.

Has a short paragraph on harvesting the beans, and on storing the seed.

181. New Jersey. Agricultural experiment station. Rye straw and soy beans. N. J. Agr. Expt. Sta. Rept. (1913) 34: 401-402. New Brunswick, 1914.

Thirty-fourth annual report of the New Jersey State Agricultural Experiment Station and Twenty-sixth annual report of the New Jersey Agricultural College Experiment Station.

The report of the Department of Farm Crops has a statement of results for soybeans planted after rye. For both crops there is given the value of the crop, total cost, total profit and average profit per acre.

182. Noll, Charles F. Soy beans for Pennsylvania. Natl. Stockman & Farmer 47(47): 1254. Feb. 23, 1924. 6 N21

The writer includes material on the value of soybeans versus oats, feeding value and yields of soybeans, the uses of the crop, its harvesting, and the varieties suited to Pennsylvania.

183. Noll, Charles F., and Lewis, R.D. Soybeans: their culture and uses. Pa. Agr. Expt. Sta. Bull. 187, 15pp. State College, Centre County, 1924.

"The purpose of this bulletin is to report soybean investigations to date, make recommendations in regard to varieties, and give brief cultural directions for the crop."

Table II. gives average yields per acre of seed and of field cured hay of varieties of soybeans, in order of yields of hay, 1913-23; table IV. shows a comparison of yields of crops in the oats rotation and in the soybean rotation; and table V. gives the feeding values of oats and of soybeans grown on alternate plots.

184. Oakley, R. A. The seed supply of the nation. U. S. Dept. Agr. Year-book, 1917: 497-536. Washington, D. C., 1918. 1 Ag84Y  
The seed supply of soybeans is discussed, pp. 523-524.

185. O'Brien, Harry R. Soy beans for profit. Combines and a cash market cause acreage to mount. Country Gent. 94(11): 19, 120-121. November 1929. 6 C833

Growth of the soybean industry has been hampered by difficulties of harvesting and lack of commercial market for the beans. The situation has changed through what the writer says is "a story of the combine harvester, of an impending shortage of protein for supplement feed, of the adoption of soy-bean meal in commercial feeds and of growing beans on contract for this latter purpose."

186. Oklahoma farm chemurgic conference. 1st, Oklahoma City, 1937. Proceedings of the first Oklahoma farm chemurgic conference...in Oklahoma City's civic center, November 9 and 10, 1937. V.p. [135pp.]  
Processed. [Oklahoma City, 1937] 281.9 Ok4

On cover: Oklahoma City Chamber of commerce.

Possibilities of chemistry and agriculture, by Harry E. Barnard, 17pp., includes, pp. 8-9, a discussion of the industrial uses for soybeans.

Soybeans in Oklahoma, by James E. Webster, 8pp., has the following statement: "In the time allotted me, I wish to review for you something of the history of soybean culture in the United States; also, tell you something of its present importance to farmers and industrialists; and finally, to present to you something of the present status and future importance of the soybean crop to Oklahoma, as revealed by a study of our experimental data."

187. Ostrander, W. A. Soy beans assure legumes for dairy farms. Jersey Bull. and Dairy World 42(11): 505, 541, 542, 543. March 14, 1923. 43.8 J48

"The soybean is 'the pinch hitter' that is being called to bat to pull the clover slump out of a bad position." Reductions in cost of production on dairy farms, the selling of surplus soybean grain to mills, and the use of the beans with corn for silage are discussed.



188. Palen, L. S. The romance of the soya bean. Asia 19(1): 68-74.  
January 1919. 286.8 Am31

The writer brings out the opportunity there is for the United States to import large quantities of soybean products from the Orient and our uses for them. The return space for shipping would, he feels, make possible the development of markets there for new commodities. He discusses the food products from the bean and concludes: "Yet even now with our science in improving seed and with our mechanical inventions, it is perhaps questionable whether the soya can ever become a great profitable staple in this country in competition with the disproportionately low costs of production in Manchuria. Although the increasing ravages of the boll weevil in the cotton belt may lead to a larger place in the South for the soya, it must be taken into consideration that the cheapness of the Manchurian product may force the cotton farmer to find another substitute in which the Chinese farmer does not compete. Nevertheless, American farmers may always retain the soya on a restricted acreage because of its unquestioned value as a forage crop and as a soil improving element in rotation. Likewise as a food for animals it may achieve to an extended use, when its concomitant advantages of the straw and the fertilizer accrue to the farmer..."

189. Pearce, J. M. Future of the soybean industry. Purdue Agr. 21(5): 104, 114. February 1927. 6 P97

"In view of all these [afore-mentioned] facts, I can see nothing but a great future for the soybean industry in our State. It is not only a profitable and practical farm crop, but it has many commercial possibilities which have not, as yet, been developed..."

190. Pelton, W. C. Hahto soy bean as a lima substitute. Rural New Yorker 79(4579): 625. Mar. 27, 1920. 6 R88

The soybean is compared with the Lima bean as to size and habit, adaptation to weather and insect attacks, and use as food. The good qualities of the Hahto soybean are listed.

191. Piper, Charles Vancouver, and others. Hay. U. S. Dept. Agr. Yearbook, 1924: 285-376. Washington, D. C., 1925. 1 Ag84Y

Contains a passage, p. 322, on soybeans, which gives soybean acreage in the United States, and the value of the hay for various farm stock.

192. Piper, Charles Vancouver, and Morse, William Joseph. The soybean. Ed. 1, 2d impression, 329pp. New York (etc.) McGraw-Hill book co., inc., 1923. (Agricultural and biological publications) 77 P66

Bibliography, pp. 288 b-310.

"The soybean, also known as soya or soja bean, has assumed great importance in recent years and offers far-reaching possibilities of the future, particularly in the United States.



It is, therefore, desirable to bring together in a single volume the accumulated information concerning this crop...

"The aim has been to present the information so as to make it useful from both agricultural and commercial standpoints, not omitting, however, much that is mainly of historical or botanical interest..."

Partial contents: Ch. I. Introduction, pp. 1-4, (includes present importance and future prospects in the United States); Ch. II. The commercial status of the soybean, pp. 5-26; Ch. IV. Agricultural history of the soybean, pp. 35-54; Ch. VI. Harvesting and storage of soybeans, pp. 85-101; Ch. VIII. Utilization of the soybean, pp. 129-143; Ch. XI. Soybean oil, pp. 194-203; Ch. XII. Soybean cake or meal, pp. 204-218; Ch. XIII. Soybean products for human food, pp. 219-258; Ch. XIV. Table dishes of soybeans and soybean products, pp. 259-279 (includes recipes); Ch. XV. Enemies of the soybean, pp. 280-288.

193. Piper, Charles Vancouver, and Morse, William Joseph. The soy bean; history, varieties, and field studies. U. S. Dept. Agr. Bur. Plant Indus. Bull. 197, 84pp. Washington, D. C., 1910. 1 P69B  
Early Agricultural History in the United States, pp. 26-27.

194. Piper, Charles Vancouver, and Morse, William Joseph. The soy bean, with special reference to its utilization for oil, cake, and other products. U. S. Dept. Agr. Bull. 439, 20pp. Washington, D. C., Dec. 22, 1916. 1 Ag84B

Contents: Introduction, pp. 1-2; Soy beans in Manchuria, pp. 2-4; Soy beans in Japan, pp. 4-5; Soy beans in Europe, pp. 6-7; Soy beans in the United States, pp. 7-9; Methods of oil extraction, pp. 9-11; Soy-bean meal as human food, pp. 11-13; Soy-bean meal as stock feed, pp. 13-14; Soy-bean meal as a fertilizer, pp. 14-15; Uses of soy-bean oil, pp. 15-16; Analyses of important varieties of soy beans, pp. 16-17; Possibility of developing a manufacturing industry with American grown soy beans, pp. 18-20.

Extracts from this bulletin appear under the title "Soy Beans" in Hoard's Dairyman 53(15): 641. May 4, 1917. 44.8 H65

An anonymous article based on the bulletin is to be found under the title "The Soy Bean. Thrives in United States - of importance as source of oil, food products, and fertilizer." U. S. Dept. Agr. Weekly News Letter 4(23): 4. Washington, D. C. Jan. 10, 1917. 1 Ag84W

195. Pope, Felix T. Soy bean growing in importance. Grain Dealers Jour. 62(2): 124. Jan. 25, 1929. 298.8 G76

The author brings out the history and increasing production of soybeans in the United States. Uses for the oil are touched upon.

196. Post, A. H. Soybeans: their adaptation and production in Montana. Mont. Agr. Expt. Sta. Bull. 335, 11pp. Bozeman, 1937.  
The writer takes up the climatic and soil adaptation of the soybean, the results of growing soybeans on irrigated and on dry land in Montana, the varieties of soybeans, and harvesting methods.
197. Pridmore, J. C. Soy beans. South. Fert. Assoc., Soil Improvement Com. Bull. 17, 6pp. Atlanta, Ga. [19--?] 57.9 So8S  
Harvesting, threshing, and storing the crop, yields and value as a farm crop for the cotton section, are included.
198. Prince, Ford S. The soy bean in New Hampshire. N. H. Agr. Expt. Sta. Bull. 181, 20pp. Durham, 1917.  
"The purpose of this bulletin is to describe methods of growing and harvesting the soy bean, to discuss ways in which our farmers may use it, and to report some field trials of varieties, inoculation and fertilization which have been made at the Experiment Station during the past few years."  
Table IV. Soy Bean Yields and Analyses, gives the constituents of sixteen varieties; and Table VII. Digestible Nutrients in 100 Pounds, compares soybean hay with alfalfa hay, red clover hay, and timothy hay.
199. Ralston purina company, St. Louis, Mo. Soybeans for beginners. 8pp. St. Louis, Mo., Ralston purina co. [1934]. Pam. Coll. 60.3 R  
"The material has been prepared by E. F. Johnson..."  
Soybeans as a solution to the corn acreage reduction problem, p. 1; the place of soybeans in the regular corn-belt rotations, p. 2; varieties recommended for commercial production, pp. 3-4; harvesting, threshing, yield of grain and seed storage, p. 6; marketing, p. 7; outlook for soybeans in the future, pp. 8-9.
200. Richardson, J. W. La soja y el conflicto sino-japonés. La Hacienda 27(8): 294-295. August 1932. 6 H11  
It is said that this plant, which plays such an important rôle in nourishment and in modern industries, forms the axis around which revolves the struggle for dominance of Manchuria. Slight reference is made to the increasing soybean importance in the United States.
201. Richert, T. G. Oils, their production and consumption. Oil and Soap 12(7): 148-152. July 1935. 307.8 J82  
"A paper presented at the 26th annual meeting of the American Oil Chemists' Society at Memphis, Tenn., May 23-24, 1935."  
Bibliography, p. 152.  
Includes figures on production of soybeans, discussion of soybean oil, and a description of the method of extraction used at the Hansa Mills in Hamburg, Germany. Diagrams of the plant are given.



202. Rindl, M. Soy bean. So. African Jour. Indus. 3(6): 518-531; (8): 742-749. June, August 1920. 286.8 Sc83

These are two installments (IV and V) of a series of articles on vegetable fats and oils, forming a Report to the Advisory Board of Industry and Science on Vegetable Oils, Fats, and Waxes. Soybeans are considered among the semi-drying oils. The author includes in his discussion the storage of seed, the value of the bean as human food and the food preparations made from them, soybean meal and its uses, fermented soybean products, vegetable cheese and soy sauce. The second installment includes methods of oil extraction, uses of the oil, the use of soybeans as forage, and enemies of the crop.

203. Robert, J. C. Preliminary report on the economic value of the soybean. 15pp. Jackson, Miss., Mississippi Agricultural college, 1915. 60.3 R54

A brief discussion of the history of the bean is given, p. 3; composition, pp. 3-4; feeding value, pp. 4-6; relation to soil fertility, pp. 6-9; yield, pp. 9-10; uses, pp. 12-14.

204. Robertson, D. W., Kezor, Alvin, and Deming, G. W. Soybeans under irrigation in Colorado. Colo. Agr. Expt. Sta. Bull. 392, 24pp. Fort Collins, 1932.

Harvesting methods, pp. 7-10; Stage to harvest soybeans, pp. 13-16.

Tables show Annual and average yields of soybean varieties grown at Fort Collins, Colorado, for varying periods from 1923 to 1926; Annual and average yields of Ito San soybeans planted at different dates for the 3-year period, 1924, 1926, and 1927; Time to harvest soybeans under irrigated conditions in Colorado; Yield of corn and soybeans sown together at Fort Collins; Hay yields of soybeans and other annual crops grown at Fort Collins, Colorado, for varying periods, 1923 to 1927.

205. Rusk, E. W. Soy beans. Ill. State Hort. Soc. Trans (n.s.) 54: 298-309. 1920. 81 Il6

The writer gives, among other things, a brief history of the soybean and the uses for which it is grown.

206. Sahr, C. A. Report of the Assistant agronomist. Experiments with leguminous plants. Hawaii Agr. Expt. Sta. Rept. 1913: 43-49. Washington, D. C., 1914.

The section of the report on soybeans, pp. 46-48, describes the making of soy sauce, and the varieties of soybean adapted to Hawaii. A table gives the "calculated acre yields of soy beans from 20 feet of running row cut for hay and fodder."

207. Salute to the "wonder bean." U. S. Dept. Agr., Agr. Adjustment Admin., Consumers' Counsel, Consumers' Guide 3(8): 3-7, 22, processed. Washington, D. C., April 20, 1936. 1.94 Ad422C



This article traces the history of the soybean, and describes its many uses, its food value, the lecithin and vitamins contained in soybeans, the food products made from them, their use as a soil-builder, and soybean production trends in this country. The opening of the cooperative industrial research laboratory at Urbana, Illinois is mentioned.

208. Satow, Sadakichi. Researches on oil and proteids extraction from soy-bean. Tôhoku Imp. Univ. (Sendai, Japan) Technol. Rept. 2(2): 41-164. 1921. 513 T574T

The writer describes the uses of the soybean as a foodstuff, uses of the oil and the bean cake, classification and analysis of soybeans and their standardization, methods of oil extraction and the influence of various factors on it, the isolation of proteids from extracted soybeans, and the effect of heating on the yield of proteid.

209. Schmitz, Nickolas. Soybeans. Pa. Agr. Col. Ext. Circ. 59, 16pp. State College, 1917.

Includes: The Soybean as Human Food, by Pearl MacDonald, pp. 15-16.

The author discusses the place of soybeans in Pennsylvania agriculture, harvesting and threshing methods, the value of the crop in increasing soil fertility, and its uses as animal food.

210. Sconce, Harvey J. The soy bean conquers industrial America. Ill. Jour. Com. 18(1): 16-17, 26, 28, 30, 32. January 1936. HF1.I33

Traces the history of the soybean, and discusses harvesting methods, extraction processes, industrial and food products derived from the beans, the utilization of the bean in the Ford plant, its invasion of the cotton lands, and its adaptability to Tennessee and Canada.

"This is the greatest conquest of territory by a plant in history. Ten years more and it will have revolutionized the industrial manufacturing of America. The soy bean had to come to the United States to get its chance, and it made good."

211. [Shaw, Norman] The soya bean of Manchuria. 32pp. Shanghai, Published at the Statistical Department of the Inspectorate General of Customs..., 1911. (China. Imperial Maritime Customs. II. Special series no. 31) 77 C44

The study includes figures on yield of soybeans in various countries, including the United States, p. 6, and the uses of the bean in the Far East and in the western world, pp. 7-13.

212. Smallwood, H. St. Clair. Romance of the soya bean. Great Britain and the East 46(1307): 752. June 4, 1936. 286.8 N27

Briefly traces the history of the soybean, its food value, its importance to Manchuria, and the recognition it has obtained in the United States, India and Germany.

213. Smith, Alfred G. New grist for the oil mills. Soys have a great market in Dixie's cottonseed plants. Country Gent. 88(6): 8, 42. Feb. 10, 1923. 6 C833

"Fortunately the South has the biggest market in the world for soy beans. There are in round numbers 1000 cotton-oil mills that crush cottonseed, and every one of these mills can be used for crushing soy beans with practically no additional expense for change of equipment..."

The writer sets down the "principal things it takes to make a go of the crop."

214. Smith, Alfred G. Soy beans in systems of farming in the cotton belt. U. S. Dept. Agr. Farmers' Bull. 931, 23pp. Washington, D. C., May 1918. 1:Ag84B

"The soy bean is destined to take a very important place in the agriculture of the cotton belt, not only as a means of improving the soil but also as a feed and commercial crop. It has already been grown with marked success in many parts of the South, and in one section of northeastern North Carolina has become a staple crop. This bulletin presents a brief description of the ways in which successful growers handle this crop in the Southern States." - p. [2].

215. Smith, Joseph Russell. The world's food resources. 364pp. New York, Henry Holt and co., 1919. 389 Sn6  
Soybean production, pp. 326-327; soybeans as a food product, pp. 360-365.

216. Smith, William C. Soybean - a crop for emergencies. It will grow and mature a big, valuable crop in a short season. Country Gent. 83(15): 8. Apr. 13, 1918. 6 C833  
Reasons for growing the crop are given.

217. Soth, Lauren K. The soybean invasion of the corn belt. U. S. Dept. Agr., Bur. Agr. Econ. Agr. Situation 21(5): 14-16. May 1937. 1 Ec7Ag

Accompanied by a chart which shows acreage of hay, beans, grazed or hogged-off, and equivalent of total solid acreage, 1924 to date.

The last paragraph contains a warning against assuming that "soybean growers can continue to expect an ever-expanding market."

This article is reprinted in Amer. Cattle Producer 19(4): 9. September 1937. 49 P94

218. The soya bean. Miller 53(2555): 832. Jan. 9, 1928. 298.8 M61  
A note based on Messrs. Kelly & Co., Ltd., of Liverpool's publication with regard to soybean production and uses.

219. The soya bean and its probable effect on the markets. Oil, Paint and Drug Reporter 75(25): 7-8. June 21, 1909. 306.8 O15



Gives an outline of the history of the soybean, its uses, and the probable effect of its introduction into Europe upon our cottonseed and linseed export market.

220. The soya bean industry. An exhaustive survey dealing with the cultivation, production and commerce of the soya bean and its oil, cake, meal and its applications to manufactured products. Chemist and Druggist 110(26): 839-842. June 29, 1929. 396.8 C42  
The writer discusses the history of the soybean, production in various countries, the Manchurian industry, the growth of soybean consumption in the world, the soybean trade of the United Kingdom and that of the United States, soybean production in the United States, and the uses, both food and industrial, of the bean. Extracts reprinted under title: "The Demand Still Grows for Soy Beans." Feedstuffs 1(20): 12-13. Sept. 28, 1929. 286.8 F322
221. Soya o soja. [Nicaragua] Ministerio de Agricultura y Trabajo. Boletín de Agricultura y Trabajo 5, 2a. época(48): 19-20. Managua, June 1933. 8 N51  
The writer briefly discusses the history of the soybean, its extension in the United States, uses as hay and oil, food products, and its enemies.
222. Soybean association discusses problems. Annual meeting of organization reviews accomplishments and value of product. Oil, Paint and Drug Reporter 122(11): 17, 34. Sept. 12, 1932. 306.8 O15  
An account of the annual meeting of the American Soybean Association at Washington, D. C., September 2 and 3, 1932. The chief talks are summarized.
223. Soybean conference attracts big crowd at Milwaukee. Grain & Feed Jours. Consolidated 77(7): 300. Oct. 14, 1936. 298.8 G762  
Excerpts from addresses at the soybean conference meeting on October 12 of the Fortieth annual celebration of the Grain and Feed Dealers National Association.  
"L. B. Breedlove...discussed the development of soybean production in this country...Austin Sturtevant...reviewed the marketing of soybeans...J. E. Barr...reviewed the development of soybean inspection..."
224. Soy bean crop coming to the front. Farmers' Elevator Guide 31(7): 12-13. July 5, 1936. 280.28 Am3  
"Now there are several questions coming up in regard to the crop. Will the crop come to be burdensome with the rapid increase in production? Will industry be able to absorb it at a price that will justify the farmers to continue to increase their output? Will it have a tendency to displace the so-called overproduction of other crops at an advantage or a disadvantage to agriculture or industry? Can we compete with the production of the crop in Manchuria and other foreign countries?"



225. Soy bean demonstration. Hoard's Dairyman 66(13): 362. Oct. 12, 1933. 44.8 H65

The article gives a résumé of some of the speeches given at the annual convention of the National Soy Bean Growers' Association held at Madison, Wisconsin. Among the subjects discussed were the increasing acreage of soybeans in Indiana, Iowa and Wisconsin; the wide usage for the by-products of the soybean; and soybeans as feed for dairy cattle and livestock.

226. Soybean growers in national meet. Fifth annual field meeting held at Ames last week. Wallaces' Farmer 49(36): 1149, 1152. Sept. 5, 1924. 6 W15

Summary of the problems discussed at the 5th annual meeting of the National Soybean Growers' Association at Iowa State College, Ames, August 29 and 30.

227. Soybean in drought year breaks all crop records. Oil, Paint and Drug Reporter 127(5): 43. Feb. 4, 1935. 306.8 O15

Increasing soybean production in the United States is discussed, with figures.

228. The soy bean invasion. Farmers' Elevator Guide 28(11): 5-8. Nov. 5, 1933. 280:28 Am3

The writer reviews the history of the soybean, its introduction into the United States and into Illinois, harvesting the beans, grading and marketing them, their use in industry and as food, and the probable future of the crop.

229. Soybean plant at Portsmouth, Va. Grain & Feed Jours. Consolidated 71(2): 77. July 26, 1933. 298.8 G762

"On the south branch of the Elizabeth River at Portsmouth, Va., The Allied Mills is erecting an up-to-date plant equipped to process, store and export soybeans...

"It is the purpose of the Allied Mills to cooperate with the various educational institutions and the soybean growers in the Carolinas and Virginia in developing and growing the type of soybeans that will be in greatest demand in the market."

230. Soybean processors. Flour & Feed 37(6): 19. November 1936. 298.8 F66

This is a very brief account of the annual meeting of the National Soybean Processors' Association in Chicago.

231. Soybean processors meet. Grain & Feed Jours. Consolidated 77(8): 362. Oct. 28, 1936. 298.8 G762

"The National Soybean Processors Ass'n met recently at Chicago and heard talks by Dr. O. E. May, director, Regional Soybean Industrial Products Laboratory, at Urbana, Ill., Dr. W. L. Burlison, head, Department of Agronomy, University of Illinois, and J. E. Barr, Marketing Specialist of the Bureau of Agricultural Economics, U. S. Dept. of Agriculture."

232. Soy beans. Calif. Univ. Jour. Agr. 7(7): 22. February 1921. 6 Un34  
Experiments at the University farm have shown that soybeans do not grow so well in the interior valleys of California as in the Central and South Atlantic States. Certain varieties of cowpeas have been found to be better from the standpoint of forage and seed production. Soybeans grow better in the cooler and more humid coast districts of Central California.
233. Soy beans. Purdue Agr. 14(7): 396, 398. April 1920. 6 P97  
Value of the soybean crop in the agricultural system is briefly touched upon.
234. Soy beans. Wallaces' Farmer 42(13): 586. Mar. 30, 1917. 6 W15  
This is a brief outline of the history, uses, varieties, culture, harvesting and handling of soybeans.
235. Soy beans increasing in popularity. Proving a useful crop for Illinois conditions. Orange Judd Farmer 69(13): 392. Mar. 26, 1921. 6 Or1  
"Approximately 5300 bushels of soy bean seed were ordered through farm bureaus in Illinois last year...Many more will be used this year." The uses of soys for planting with corn and as a substitute for clover are discussed.
236. Soy beans new East Texas crop. East Texas Chamber Com. East Texas 9(11): 12, 32. August 1935. 6 Ea73  
"Soy beans as a new East Texas crop brought 100 cottonseed oil mill operators, agricultural leaders and others together for a conference at Clarksville, July 10, under the auspices of the East Texas Chamber of Commerce.  
"A. G. (Pat) Mayse, of Paris, [Texas] President of the East Texas Chamber, has taken the active leadership in calling the attention of East Texas to the possibilities of this remarkable product of nature..."
237. Soy beans on Meharry farm. Orange Judd Farmer 66(8): 312. Feb. 22, 1919. 6 Or1  
"Soy beans as a regular crop have been very successful on the A. P. Meharry farm in Champaign county, Illinois. They have been grown there for nine years and the crop is considered of increasing value each year, as the acreage has been gradually increased."
238. Soy beans to the front. Farmers' Elevator Guide 31(4): 14. April 5, 1936. 280.28 Am3  
Brings out the growing importance of soybeans in the United States.
239. Soy beans to the rescue. Facing a shortage of legume hay, southern Wisconsin farmers turn to the soy bean for relief. Hoard's Dairyman 74(5): 242-243. Mar. 10, 1929. 44.8 H65  
Contains a slight passage on harvesting and expected yields.



240. Special southern grain and forage crops. U. S. Dept. Agr. Monthly Crop Rept. 4(5): 48-50. Washington, D. C., May 1918. 1 St20t  
Includes a section (p. 48) on soybeans, which points out increases in acreage and the uses for the beans. A map shows the location of plantings in the United States, and a table (p. 49) gives acreage planted in 1917, amounts harvested for grain and hay, yields per acre, percentages placed in silo and grazed or hogged off, and percentage plowed under for soil improvement. Information in this table is given for each state producing the beans.
241. Špírk, Ludvík. [Soybean as a raw material in chemical industry] Chemické Listy 30: 116-119, 134-137, 151-157. 1936.  
Not examined.  
"The history, botany, compn., development and uses of the soybean are reviewed. In Czechoslovakia it is grown on 2000 hectares with an annual yield of 30-50 carloads; most of this is extd. for oils or used for animal food. Some of the native soy is made into 'Kaboul,' a coffee substitute; it contains vegetable proteins 40, vegetable fats 20 (97% of which are digestible), lecithin 2 and mineral ash 6. The mineral ash contains P compds. 30, K compds. 30, Mg 10 and Ca 5%. Narcotics, caffeine or carbohydrates are not present in Kaboul." - Chem. Abs. 30: 7717. November-December 1936.
242. Squirrell, W. J., and Laughland, J. Soybeans in Ontario. Ontario Dept. Agr. Bull. 366, 16pp. Guelph, 1932. 101 On8B  
Harvesting, threshing, and uses of the crop, pp. 13-15.
243. Steece, Henry M. Soybean projects of the state agricultural experiment stations, 1937. 17pp., processed. [Washington, D. C.] U. S. Dept. of Agriculture, Office of experiment stations, May 20, 1937.  
1.9 Ex6So  
"The entries in the list indicate the experiment station, the project title, leadership, station departments involved, cooperation with Bureaus of the Department of Agriculture, and if supported entirely or in part by Federal funds...  
"This list supersedes a similar publication entitled Soybean Projects of the State Agricultural Experiment Stations, 1935-36 (March 14, 1936)." - Explanatory note.
244. Stehlé, H. Le soja. Revue Agricole [Guadeloupe] 7(9): 249-256. August 1935. 8 R327  
Bibliography, p. 256.  
Agricultural utilization, food value, industrial uses, and harvesting of the soybean are touched upon, among other things.
245. Stewart, C. L., Burlison, W. L., Norton, L. J., and Whalin, O. L. Supply and marketing of soybeans and soybean products. Ill. Agr. Expt. Sta. Bull. 386, pp. 425-544. Urbana, 1932.  
Literature cited, pp. 541-542.



"The purpose of the present study has been to examine the supply situation with respect to both soybeans and soybean products, the present and potential markets for soybeans, the means and methods by which they are marketed, their economic characteristics in relation to improvements in marketing, and the influence of various factors on the prices paid for them...

"The information herein presented it is believed will be useful, not only as a basis for understanding the economic developments affecting soybeans in recent years, but also as a means of determining the tendencies which will count heavily in the future in establishing the place of this crop in the agriculture of the state." - p. 426.

Contains numerous tables and graphs showing prices for soybean products, and exports and imports for various countries.

Reviewed by R. B. J. in Malayan Agr. Jour. 21(9): 449-450.  
September 1933. 22.5 F312

246. Stewart, John R. The soya bean and Manchuria. Far East. Survey 5(21): 221-226. October 21, 1936. 280.9 In782

"Principal sources", p. 226.

"To observers of Far Eastern affairs, the significance of expanding American production of soya beans lies in the possibility of American competition with the Manchurian product. The growth of American production will not adversely affect Manchuria as long as the American beans are consumed within the country; for the United States has been in the past a very small purchaser of Manchurian beans and bean oil, which find Asiatic and European markets...

"It should be pointed out, however, that American production is possible of great expansion, for conditions in the Middle West are well suited to soya bean cultivation. Moreover, production costs by American methods of mechanized farming compare favorably with Manchurian costs, which are based on hand tillage..."

The reasons for Manchuria's success with the soybean and the situation and prospects with respect to the Manchurian industry are discussed.

247. Stewart, P. H., and Gross, D. L. Soybeans in Nebraska. Nebr. Agr. Col. Ext. Circ. 142, 5pp., processed. Lincoln, 1936. 275.29 N272Ex

"U. of N. Agr. College & U. S. Dept. of Agr. Cooperating."

Brings out acreage in Nebraska and adjoining states planted in soybeans; yields; harvesting; composition of soybean hay, grain and cake; and future possibilities for the crop.

248. Stietz, Erich. Die soja in der weltwirtschaft; ein beitrag zur ernährungs- u. rohstoffwirtschaft der erde. 46pp. Giessen, Druck der Buchdruckerei der Anstalt Bethel, Bethel bei Pielefeld, 1931. 60.3 St5

Dissertation - Giessen.

"Literaturverzeichnis", pp. 45-46.

This is a discussion of the soybean in world trade, and includes material on the history and botany of the bean, pp. 6-9; world production, pp. 9-11; international trade, pp. 28-34; the uses of the soybean, pp. 34-38.

249. [Sturtevant, Austin.] The soy bean - agriculture's "extra dividend." Grain & Feed Jours. Consolidated 75(9): 362, 369. Nov. 13, 1935. 289.8 G762

"The soy bean appears this year in the role of an 'extra dividend' to agriculture, and a boon to the grain trade. For the first time in agricultural history the bean attracts the attention of all handlers and merchandisers, according to Austin Sturtevant of Bartlett Frazier Co." The great increase in soybean production in this country, the value of the beans to the farmer and marketing methods and grades are touched upon.

250. Sumner, H. R. Growing soybeans in eastern Kansas. Kansas Agr. Col. Ext. Circ. 39, 7pp. Manhattan, 1923.

Briefly mentions value of the crop as grain and forage, harvesting, threshing and storing of seed.

251. Sweeney, O. R., and Arnold, Lionel K. Processing the soybean. Iowa State Col. Engin. Ext. Bull. 103, rev. 59pp. Ames [1935] (Official Publication, v. 34, no. 14. Sept. 4, 1935) 290.9 Ic94 no. 103

References, pp. 56-58.

"The purpose of this bulletin, which was first published in 1929, is to present information, particularly from an engineering standpoint, on the practicability of soybean oil production in the American Corn Belt, with special reference to the state of Iowa..."

The following phases of the subject are considered: characteristics of the soybean, its uses, place in Iowa agriculture, the soybean and the nitrogen, protein and vegetable oil problems, methods of producing soybean oil (including the hydraulic press and Anderson expeller methods, and the solvent extraction system), plant design, production costs and methods of calculating them.

Contains a list of unpublished theses presented for the B.S. degree to the Iowa State College of Agriculture and Mechanic Arts.

252. Tabor, Paul. Soy beans for Georgia. Ga. Agr. Col. Ext. Circ. 90, [4]pp. Athens, 1923.

The varieties best suited to Georgia, the effect of soybeans on the soil, and harvesting of the beans are discussed.

253. Thatcher, L. E. The soybean in Ohio. Ohio Agr. Expt. Sta. Bull. 384, pp. 51-68. Wooster, 1925.

Literature cited, p. 56.



Partial contents: Residual effect on soil fertility, pp. 34-36; Harvesting and threshing the grain crop, pp. 42-44; Making soybean hay, pp. 44-46; Soybean silage, p. 46; Varieties, pp. 46-48; Soybeans as an emergency crop, pp. 48-50; Corn and soybeans as mixed crop, pp. 50-54; Sudan grass and soybeans for hay, p. 54; Labor cost of producing soybean hay and seed, pp. 54-55.

The following tables are appended to the bulletin: 1. 9-year average yields of crops in various rotations - Wooster 1916-1924, inclusive; 2. Soil nitrates, soil moisture, and wheat yields following soybean hay cut at different dates; 3. Composition of soybeans harvested for hay at different dates, Wooster; 4. Nitrogen, phosphorus, potassium, calcium, and magnesium content of soybean hay and roots. Date-of-harvest test at Wooster, 2-year average percent, 1922-23; 9. Soybean varieties grown at Ohio state university, yield per acre; 10. Soybeans in variety test at Wooster: yield per acre; 11. Soybean hay in variety tests at Wooster: yield per acre; 12. Average yield of soybean seed in variety tests on experiment farms of the state; 13. Average yield of soybean hay in variety tests on experiment farms of state; 14. Corn and soybeans (grain), average per acre of triplicate test plots at Wooster, 1923; 15. Corn and soybeans (silage), average of triplicate test plots at Wooster, 1923; 16. Average expectancy of corn and soybean per acre based on 23 separate tests in Cornbelt states; 17. Ebony soybeans and Sudan grass mixture for hay, rate of seeding and yield per acre.

254. Thatcher, L. E. The status of the soybean crop in Ohio. Ohio Agr. Expt. Sta. Monthly Bull. 8(3-4, whole nos. 87-88): 59-63. March-April, 1923.

Gives the results of questionnaires mailed to 300 soybean growers of Ohio by the Department of Agronomy of the Ohio Agricultural Experiment Station, asking the status of the soybean crop on the farm. Yield per acre and cost of production are among the topics discussed.

255. Timberlake, E. M. Experience with soy beans. Rural New Yorker 93(5307): 660. Nov. 10, 1934. 6 R88

The writer has found that "the ordinary farmer can now engage in their production with no more risk than is involved in raising a crop of corn or wheat." He mentions the harvesting methods he has used, and the prices he has received for soybean hay.

256. Todd, G. R. Growing cow peas and soy beans. Rural New Yorker 82(4747): 846-847. June 16, 1923. 6 R88

The author finds that soybeans are superior to the peas for every purpose. He includes a paragraph on harvesting for seed.

257. Torres Herrera, José M. El haba soya, su cultivo y beneficio. [Nicaragua] Ministerio de Agricultura y Trabajo. Boletín de Agricultura y Trabajo 6, 3a. época (54): 24-25, 26; (55): 6-7, 8; (56-57): 6-10, 11-12. August-October/November 1934. 8 N51

The second installment briefly discusses seed production of the soybean, and yields of various varieties, and the third describes the harvesting of the crop, the many uses of the bean as human food, as forage, in mixtures with other crops, and as a green manure.

258. Towar, J. D. Cowpeas, soy beans, and winter vetch. Mich. Agr. Expt. Sta. Bull. 199, pp. 165-176. Agricultural College, 1902.

Soy beans, pp. 171-174, includes brief passages on harvesting the crop and the feeding value of the beans.

Also printed with Mich. Agr. Col. Ann. Rept. (1902) 15: 222-230.

259. U. S. Department of agriculture. Use native soy beans. Imported soy beans are mixture of many varieties and undesirable for seed. U. S. Dept. Agr. Weekly News Letter 4(47): 8. Washington, D. C., June 27, 1917. 1 Ag84W

Farmers are urged to buy native soybeans, as the Oriental ones are bought up by merchants and stored at railway stations, and no grading is attempted.

This same article, with minor changes in wording appears under the title "Imported soy bean seed" in U. S. Dept. Agr. Weekly News Letter 5(31): 4-5. March 6, 1918.

260. U. S. Department of agriculture, Bureau of agricultural economics. The soybean outlook. 4pp., processed. [Washington, D. C.] U. S. Dept. of agriculture, Bureau of agricultural economics, March 26, 1937. 1.9 Ec71Soy

"This report has been prepared with particular reference to the report of farmers' intentions to plant as issued March 19 by the Crop Reporting Board of the Bureau of Agricultural Economics."

"At present, the soybean situation is favorable to growers, with good prices being paid as a result of reduced production in 1936 and strong demand for both oil and meal. The immediate outlook is also satisfactory, with the seasonal demand for soybeans for seed purposes expected to offset the price-depressing effect of a possible decline in meal prices.

"For the last part of 1937, however, the outlook is less favorable...."

261. U. S. Department of agriculture, Bureau of plant industry. Soy bean. U. S. Dept. Agr. Dept. Circ. 120, 4pp. Washington, D. C. 1920. 1 Ag84D

Includes a brief description of the uses, the adaptation of certain varieties to certain uses, and harvesting of the soybean.

262. U. S. Department of commerce, Bureau of foreign and domestic commerce. Soya beans for American mills. U. S. Dept. Com., Bur. Foreign and Domestic Com. Com. Repts. no. 125, pp. 795-799. Washington, D. C. May 29, 1917. 157.7 C76D



This article includes a report from A. A. Williamson, who discusses the Manchurian soybean industry with reference to the possibility of soybean imports for use in American mills.

263. U. S. Department of commerce, Bureau of foreign and domestic commerce, Far Eastern division. Oil and oilseeds of the Orient. U. S. Dept. Com., Bur. Foreign and Domestic Com. Com. Rept. no. 33, pp. 611-616. Washington, D. C., Feb. 8, 1919. 157.7 C76D

The writer reviews the importance of the soybean in the Far East, its cultivation and harvesting in China, preparation of bean curd, marketing oil in China, Japanese production and exports to the United States, increasing production in China, and imports of soybean oil to the United States. He concludes that "American importers of Far Eastern products may well investigate the domestic market for Far Eastern oilseeds with a view to supplying oil mills in the United States with raw material."

264. U. S. Department of commerce and labor, Bureau of manufactures. Soya bean and products. U. S. Dept. Com. and Labor Spec. Cons. Repts. 41, pt. 5, 35pp. Washington, D. C., 1909. 157.7 C76S

Erroneously numbered Special Consular Reports, vol. XL.

"In compliance with requests from manufacturers of cotton-seed products in the United States, who desired that an investigation be made of the production and use of the soya bean and its manufactures in the Far East and of the extent to which they compete with American cotton-seed products in the European markets, the reports following have been submitted by consular officers in the various countries concerned..."

"The reports of the consular officers have been placed in two groups, the first having to do with the countries that produce the soya bean and the second with the countries that are sought as markets. Statistics as to the imports of soya-bean products in many European countries were not available at the time the reports were submitted, but inasmuch as the prices quoted were generally lower than for other seed products, emphasis has been laid upon the relative merits of the two classes of goods as shown by experiments and analyses in these countries. These features will indicate the lines along which American cotton-seed manufacturers will have to work in meeting this new competition." - Introduction, p. 3.

265. U. S. Tariff commission. Summary of tariff information, 1920; prepared for the use of the Committee on ways and means, House of representatives. 1004pp. Washington, Govt. print. off., 1920. 173 T17Su

Chinese soy sauce, p. 322; Paragraph 606, Act of 1913, given on pp. 779-780, contains a description of the soybean, its uses, production, and import quantities, and the tariff regulations applicable to the various soy products.

266. U. S. Tariff commission. Summary of tariff information, 1921, relative to the bill H. R. 7456. 1625pp. Washington, Govt. print. off., 1922. 173 T17Su
- "The principal sources of information have been the commodity surveys and reports of the Tariff Commission, especially the 'Summary of Tariff Information, 1920.' The material in the latter has been amplified and brought up to date."
- Soybeans are more specifically dealt with in the 1920 Summary. Soybean oil, however, is considered in H.R. 7456. "Soya-bean Oil," p. 152, gives a description of and the uses, production and imports of the product, and points out that while it was exempt from duty under the Act of 1913 (par. 561) it is dutiable under the emergency tariff act of 1921 (par. 11).
267. U. S. Tariff commission. Summary of tariff information, 1929 on Tariff Act of 1922. Schedule 1. Chemicals, oils, and paints, compiled by the United States Tariff Commission and printed for the use of the Committee on ways and means, House of representatives. 419, xvpp. Washington, U. S. Govt. print. off., 1929. 173 T17Su
- Soy-bean Oil, pp. 283-284, briefly gives some of the uses for the oil, production in the United States, imports into the United States, exports, cost of production, prices and competitive conditions.
268. The useful soya bean. Commercial possibilities. Liverpool Trade Rev. 26(12): 245-247. Dec. 15, 1927. 287 L753
- "Compiled from a report prepared by Mr. A. Grenville Turner, of Messrs. Kelly & Company...Liverpool." - Note.
- Describes the increasing importance and production of soybeans in the United States, and their food and industrial uses.
269. Vandenburg, J. T., Jr. Soybeans as a farm crop. Soybeans have many valuable uses in agriculture and commerce. Penn State Farmer 22(5): 9, 13. February 1929. 276.8 P38
- "The raising of soybeans is not a new thing, even in this country, but before going into the more descriptive phases of the industry, it might be well to discuss the facts relative to their introduction and development in the United States, and see if the factors which have made them so popular in other sections are equally applicable to Pennsylvania conditions."
270. Viljoen, N. J. An investigation into the composition of the soybean in South Africa. Union of South Africa Dept. Agr. and Forestry. Sci. Bull. 169, 68pp. Pretoria, Printed in the Union of South Africa by the Government printer, 1937. (Chemistry Series No. 151) 24 So84S
- Bibliography, pp. 66-68.
- Thesis (Doctor of Science) - University of Pretoria, 1936.
- Introduction, pp. 5-8, takes up the uses for the soybean and its place in various countries.



271. Virginia. Department of agriculture and immigration. The soy bean. Va. Dept. Agr. and Immigr. Bull. 118, pp. 4-6. Richmond, 1917. 2 V81B  
Includes brief paragraphs on the history of the soybean, its harvesting, and use as human food.
272. Voorhees, John H. The soybean in New Jersey. N. J. Agr. Expt. Sta. Circ. 21, 8pp. [New Brunswick, 1913?]  
The uses of the soybean, harvesting and threshing, and its feeding value are considered.
273. W. Die sojabohne und ihre verwendung in der nährmittelbranche. Konserven-Zeitung 14(48): 377-378. Nov. 28, 1913. 389.8 K83  
"A brief account of the history, nutritive value, and utilization of the soy bean." - Expt. Sta. Rec. 30: 760. 1914.
274. Wand, Frederick A. Handling and preparing soybeans for market. Grain & Feed Jours. Consolidated 68(3): 145. Feb. 10, 1932. 298.8 G762  
Harvesting at a time to secure the lowest moisture content, proper handling in storage, and use of the combine in harvesting, are suggested.
275. Wand, Frederick A. The soybean industry. Farmers' Elevator Guide 22(12): 50-51. December 1927. 280.28 Am3  
The author includes a discussion of the value of soybeans as a soil builder, the increase in soybean acreage in Illinois, the marketing of soybeans, and soybeans and the tariff.
276. Wand, Frederick A. The soybean industry in this country. Grain World 100(11): 11-12. Sept. 26, 1928. 286.8 C49  
The writer takes up the marketing of soybeans and their manufacturing possibilities and points out that "every acre planted to soybeans means one less acre of surplus crops, such as corn, wheat and oats."
277. Ware, A. M. The soya bean. So. Aust. Dept. Agr. Jour. 41(1): 50-52. August 1937. 23 So8J  
Harvesting and uses of the bean for food are briefly discussed.
278. Weed, A. R. Soy beans a standard Illinois crop. Orange Judd Farmer 69(32): 795. Sept. 15, 1921. 6 Or1  
A description of the second annual corn belt soybean day held at Champaign and Tolono, Illinois, on September 1st. The uses of the bean and methods of handling on Meharry Farm were among the matters demonstrated.
279. Westbrook, E. C. Results with special crops in the Piedmont section in 1922. Ga. Agr. Col. Ext. Circ. 89, 4pp. Athens, Ga., 1923. 275.29 G

"In an effort to determine which crops were showing the greatest promise in the Piedmont section a brief survey was made in December to find out what returns the farmers had gotten from special crops in 1922." Soybeans are given, p. 2.

280. Whittle, Charles A. Why soy beans? So. Fert. Assoc., Soil Improvement Com. Circ. 3, 4pp. Atlanta, Ga. [19--?] 57.9 So8

The use of the soybean as flour and as a milk in human nutrition, its use as a stock feed and in industry, the increasing demand for the beans in this country, and yields and returns are briefly outlined.

281. Wiancko, A. T., and Fisher, M. L. Soy beans, cowpeas, and other forage crops. Ind. Agr. Expt. Sta. Bull. 120, pp. 439-460. Lafayette, 1907.

Part I. Soy Beans and Cow Peas, gives an historical summary of the two crops, and describes their uses and value, culture, harvesting and threshing, and costs of production.

282. Wiancko, A. T., and Cromer, C. O. Soybeans in Indiana. Ind. Agr. Expt. Sta. Bull. 238, 16pp. Lafayette, 1920.

The value and uses, both farming and industrial, of the crop, their place in the rotation, harvesting and threshing, and varieties to be planted for various purposes, are among the subjects taken up.

283. Wiancko, A. T. Soybeans in the Corn belt. Field Illus. 32(4): 205-207. April 1922. 42.8 Sp6

The advantages of planting soybeans in the crop rotation, the prices obtained for grain and seed, uses of the crop, and its future prospect as a commercial crop are discussed.

284. Wiggins, R. G. Cayuga soybean: a home-grown high-oil high-protein concentrate. N. Y. (Cornell) Agr. Expt. Sta. Bull. 601, 32pp. Ithaca, 1934.

References, pp. 31-32.

The author takes up the place of the soybean in United States and in New York agriculture, the composition and digestibility of ground soybeans, the monetary value of one bushel of soybeans, results in soybean feeding trials with dairy cattle, the history, description and chemical composition of the Cayuga soybean, the residual effect and fertilizer effects of soybeans, harvesting, threshing and handling of the grain.

285. Wiggins, R. G. Varietal experiments with soybeans in New York. N. Y. (Cornell) Agr. Expt. Sta. Bull. 491, 19pp. Ithaca, 1929.

The bulletin contains sections on soybean production in the United States, the utilization of soybeans, the results of the varietal experiments in terms of green and dry-weight yields and yield of threshed grain. Table 8, p. 19, gives the best varieties for New York to be grown for hay, grain and green manure when the factors of yield, cost of seeding, habit of growth, length of growing season, and availability of seed are considered.



286. Wilkins, F. S. Buying soy bean seed. Wallaces' Farmer 46(14): 613.  
Apr. 8, 1921. 6 W15  
Indications, evidenced by the fact that soybean seed prices are higher than those of corn and small grain, point to a scarcity of northern grown soybean seed. Advice is given to buyers of seed.
287. Wilkins, F. S. Growing soy beans as a cash crop. Soy bean meeting in Missouri shows opportunities for wider use of crop. Wallaces' Farmer 47(42): 1232. Oct. 20, 1922. 6 W15  
Soybeans as a cash crop was one of the subjects discussed at a meeting of farmers and experiment station workers interested in soybeans, in September. The speakers included Professor J. C. Hackleman, W. E. Riegel, D. D. Taylor (The Possibility in Soy Bean Production for Oil Markets from the Manufacturer's Viewpoint), L. P. Nemzek, and Alex. W. Beemer.
288. Wilkins, F. S. Soybeans in the Cornbelt. A legume that is easily grown and yields well. Successful Farming 20(3): 5, 92-93. March 1923. 6 Sul2  
The author points out the increasing acreage planted to soybeans in the Corn Belt, and the advantages and uses of the crop.
289. Wilkins, F. S. Soybeans in the Cornbelt. Wallaces' Farmer 45(15): 1081, 1093. Apr. 9, 1920. 6 W15  
"Soy beans are growing in popularity in the corn belt at a very rapid rate. Reports from eighty-two county agents show that there were over five times as many soy beans grown in their counties in 1919 as in 1918, and these same county agents state that indications are favorable for a still greater increased acreage in 1920 if seed can be obtained...Farm Bureau reports show that 89 per cent of the soy beans grown in 1919 were seeded with corn." The uses of the crop and harvesting methods are included in the discussion.
290. Wilkins, F. S. Soybeans to replace oats. Even thin, acid soils can grow soys. Wallaces' Farmer 55(15): 742, 762. Apr. 12, 1930. 6 W15  
"In any event we are conservative when we say that soybeans can be used profitably to replace part of the oat acreage, on nearly all farms."
291. Wilkins, F. S. Where soybeans replace oats. Wapello county, Iowa, community finds soys yield more and pay better. Wallaces' Farmer 53(12): 477. Mar. 23, 1928. 6 W15  
Experience of Washington township, Wapello county, with soys.
292. Williams, C. B. Soybean growing in North Carolina. N. C. Agr. Col. Ext. Circ. 127, rev., 19pp. Raleigh, 1929.  
Besides cultural methods, the circular takes up the harvesting

of soybeans for hay and seed; their uses for soil improvement, soiling purposes and pasturage; utilization of the soybean crop in the United States and in North Carolina by percentages; cost of growing the beans; the crushing of the beans from the standpoint of millmen and farmers; the products secured by oil mills in crushing; the amounts millmen can afford to pay for beans; possibilities for the future use of soybean oil and meal; and the advantages to farmers of soybeans over other oil-bearing seed crops.

293. Williams, C. B. Soy bean growing in North Carolina. N. C. Agr. Expt. Sta. Circ. 31, 8pp. Raleigh and West Raleigh, 1915. :

A brief history of the soybean crop throughout the world, the value of soybeans in mixtures, harvesting for hay and seed, soybeans for soil improvement, for soiling purposes and for pasturage are included.

294. Williams, C. B. Soy beans for seed. Country Gent. 81(35): 1592. Aug. 26, 1916. 6 C833

"Although the soy-bean crop will in all probability find its greatest usefulness for soil-improving purposes, and to a less extent for pasturage purposes, there is no question that under average conditions there will be developed a considerable seed industry." Harvesting and curing the seeds are briefly discussed.

295. Williams, C. B. Soy beans in North Carolina. Country Gent. 81(14): 738. Apr. 1, 1916. 6 C833

This is a brief summary of the soybean situation in North Carolina, the amount produced, the uses to which it is put, and the value of the crop as imported into this country from the Orient.

296. Williams, C. G., and Park, J. B. Soybeans: their culture and use. Ohio Agr. Expt. Sta. Bull. 312, pp. 577-600. Wooster, 1917.

This Bulletin is made up of two articles: Soybean Culture, by C. G. Williams, and Uses of Soybeans, by J. B. Park.

The first article points out the amount of soybean production in Ohio and the place of the soybean in Ohio agriculture, and includes information on harvesting methods of soybeans for hay, for silage, and for seed. It also discusses the varieties for various purposes and their yields, and the effect of soybeans in crop rotations.

The second article takes up the uses of soybeans for animal food, the special uses for meal and oil, and the uses of the beans for human consumption. Charts show the pounds of digestible protein in 100 pounds of soybeans as compared with salmon (canned), veal cutlets, beef (round), beans (navy), ham (smoked), ham (fresh), eggs (uncooked), wheat flour, corn meal, rice, milk (skimmed), milk (unskimmed), and potatoes; and the relative quantities of each of these products that may be bought for a dollar.



An extract of this bulletin appears in Internatl. Inst. Agr. Rome Internatl. Rev. Sci. and Pract. Agr. 10(3): 285-287. March 1919. 241 In82

An extract of C. G. Williams' paper entitled "Harvesting Soybeans. Special Care Needed in Cutting and Curing the Crop", is printed in Ohio Agr. Expt. Sta. Monthly Bull. 2(8, whole no. 20): 253-254. August 1917.

An extract of J. B. Park's paper entitled "Soybeans as Human Food. Palatable Dishes Made from a Comparatively New Legume", is printed in Ohio Agr. Expt. Sta. Monthly Bull. 2(9, whole no. 21): 299-303. September 1917.

297. Williams, Thomas A. The soy bean as a forage crop. U. S. Dept. Agr. Farmers' Bull. 58, 24pp. Washington, D. C., 1899. 1 Ag84F

Discusses the general characteristics and origin of the soybean, its varieties, harvesting, yield, chemical composition, digestibility, and value and uses.

The appendix, pp. 20-23, is an article entitled "Soy Beans as Food for Man" by C. F. Langworthy. Tables give a chemical analysis of various varieties of soybeans, a chemical comparison of soybean milk and cows' milk, and the composition of food products made from soybeans.

298. Wilson, Harry D. Soy beans. 7pp. [Baton Rouge? La., 1916?] Pam. Coll. 60.3 W

Soybeans as a crop for Louisiana are advocated. It is pointed out that soybeans give a greater yield of meal than, and as much oil as cotton seed.

299. Winters, R. Y., and Herman, V. R. Soybeans for the Piedmont and mountain sections of North Carolina. N. C. Agr. Col. Ext. Circ. 111, 15pp. West Raleigh and Raleigh, 1921.

The varieties suited to the sections studied, the use of soybeans in the rotation, use for hay and seed production, soil improvement, and cultural methods are brought out.

Tables show comparative yields of hay from cowpeas and soybeans, and the comparative food content of soybean hay and red clover, alfalfa, oat and cowpea-hays.

300. Woertge, Karl Heinz. Entwicklung und weltwirtschaftliche bedeutung der sojabohnenerzeugung und -verarbeitung. 118pp. Coburg, 1937. 281.360 W82

Inaug. -diss. -Erlangen.

Bibliography, pp. 115-118.

This is a study of the soybean, its production, its importance in world economy, and the utilization of its derivatives. A brief outline of the history of the soybean in the United States is given, pp. 24-25, historical development of soybean culture in single states, pp. 25-27, the foreign trade of the United States in soybeans, pp. 75-76, in soybean oil, pp. 90-91, and in soybean cake, p. 100.

301. Woods, Charles D., and Bartlett, J. M. Soy beans in Maine. Maine Agr. Expt. Sta. Bull. 106, pp. 113-121. Orono, 1904.  
"Because of numerous inquiries, the Maine station has experimented somewhat with this crop. The results of these experiments are here reported and there are also included such deductions and citations from Farmers' Bulletin 58 and the publications of the Massachusetts and Storrs stations as seem adapted to Maine climate and conditions." Harvesting, yield, nutrients in the soybean, soybean silage, and yield of dry matter and protein are discussed.

302. Worden, A. M. What is the most profitable method of handling soy beans? Prog. Farmer (Miss. Valley ed.) 34: 1045. June 21, 1919.  
Not examined.

303. Zahnley, J. W. Soybean production in Kansas. Kans. Agr. Expt. Sta. Bull. 249, 31pp. Manhattan, 1930.  
The following summary is given:  
"1. The soybean is adapted to the eastern three or four tiers of counties in Kansas. Drought and rabbits are the principal hindrances to growing it farther west. 2. It is adapted to about the same general conditions as corn, but will produce a fair crop on land which is too poor to raise good corn. It will also grow on soils that are too acid for alfalfa or sweet clover. 3. No other crop in Kansas will produce so much protein per acre as the soybean. The seed may be substituted for the expensive protein concentrates as cottonseed or linseed meal or it may be marketed as a cash crop. 4. Soybean hay compares favorably with alfalfa or clover in feeding value and may be used to supplement a shortage of alfalfa in the eastern third of the state. 5. When grown as a companion crop with corn and pastured off a better balanced feed is produced on which sheep or hogs make good gains with a saving of the cost of harvesting..."

#### COST OF PRODUCTION AND RETURNS

304. Barlow, Floyd F. Some interesting experiences with the soy bean crop in New Jersey. Soy beans still an experimental crop in the northern states - how one farmer produced them, and what it cost - the immediate factors to be considered in threshing. Trib. Farmer 12(610): 1. July 10, 1913. 6 N484  
Detailed cost figures are presented.
305. Barr, Harold T. Corn and soybean production. La. Agr. Expt. Sta. Bull. 253, 14pp. Baton Rouge, 1934.  
Includes a section on the harvesting of soybean seed, and gives a tabular summary of labor and power to produce the crop.



306. Butler, William Reynolds. The labor-saving soy. A crop for seed, feed and the soil of run-down fields. Country Gent. 81(19): 964-965, 994-995. May 6, 1916. 6 C833.  
The financial importance of the soybean crop is emphasized, and figures on expenses and profits from a soybean demonstration given by Herman Hughel in 1914 are reproduced.
307. Farver, Warner E. Cost of soy-bean hay. Natl. Stockman and Farmer 42(50): 1234-1235. Mar. 8, 1919. 6 N21  
The writer analyzes the costs of producing soybean hay and clover hay, and concludes that although soybeans are the more expensive to produce, other advantages outweigh that factor.
308. Farver, Warner E. Soybean hay and feeding costs. Ohio Farmer 140 (19, whole no. 3635): 427. Nov. 10, 1917. 6 Oh3  
"Everybody knows the place wheat bran has in many rations, and also the price it generally has. When we consider that the analyses of bran and soybean hay are practically the same, and that 1 1/2 to two tons of soybean hay can be raised per acre, we see why so many successful feeders use it."
309. Greene, R. E. L. Cost of producing farm products in North Carolina. N. C. Agr. Expt. Sta. Bull. 305, 127pp. Raleigh, 1936.  
Cost of Producing Soybeans, pp. 85-88, has the following tables:  
Labor and material requirements per acre for production of soybeans; Cost per acre of producing soybeans; Labor requirements by operation per acre on soybeans. Figures apply to Craven County only.
310. Harvey, T. Weed. Pays net return of \$43.17 per acre. Soybean crop makes a neat profit for the Indiana farmer - special method of culture. Farm Life 34(8): 9. August 1915. 6 F2238F  
Figures are cited for cost of production, gross return and net return.
311. Johnson, O. R., and Green, R. M. Cost of producing some Missouri farm crops. Mo. Agr. Expt. Sta. Bull. 165, 26pp. Columbia, 1919.  
Cost of producing soybeans, pp. 20-22.  
"A preliminary report on these studies has been made in Bulletin 125 of this Experiment Station. Additional and more detailed information on the cost of horse labor is presented in Bulletin 152...This publication is intended to give a rather condensed statement of crop production costs as determined up to this time."
312. Johnson, O. R., and Foard, W. E. The cost of production on Missouri farms. Mo. Agr. Expt. Sta. Bull. 125, pp. 285-316. Columbia, 1915.  
The cost of producing farm crops, pp. 302-309, includes figures and discussion on the cost per acre of producing soybeans, and the profit per hour man labor.

313. Kentucky. Agricultural experiment station. Hogging down experiments. Kentucky Agr. Expt. Sta. Ann. Rept. (1919, pt. 1) 32: 39-40. Lexington, [1920].  
Gives costs and profits of hogging down corn alone, hogging down corn and allowing the hogs the run of a self-feeder of tankage, hogging down of corn and soybeans grown together, hogging down soybeans alone, and hogging down soybeans and feeding corn in a self-feeder.
314. Kidder, A. F., and Dalrymple, W. H. "Hogging down crops." Cost of producing crops and pork. La. Agr. Expt. Sta. Bull. 187, 19pp. Baton Rouge, 1923.  
In the course of the studies it was found that "corn and soy beans gave the cheapest gains when 'hogged down' in comparison with corn and cowpeas, corn, soy beans and sweet potatoes, sweet potatoes and soy beans and sweet potatoes alone. With corn and soy beans, the cost of producing 100 pounds of feed amounted to 2.9 man hours and 4.6 horse hours and the cost of producing 100 pounds of pork was 13.6 man hours and 21.6 horse hours... Soy beans should be substituted for cowpeas in south Louisiana..."
315. Mathews, I. J. Some soybean experiences. Actual results with an important crop. Successful Farming 19(4): 12, 73. April 1920. 6 Jul 2  
Costs, yields and profits are discussed with reference to specific cases.
316. Montgomery, Cary W. Factors affecting labor and miscellaneous costs of producing crops. Ohio Agr. Expt. Sta. Monthly Bull. 5(5, whole no. 53): 154-158. May 1920.  
Tables show a comparison of rotations: five-year average yield and value per acre, 1915-1919 at the Northeastern Test Farm, and crop costs and net receipts per acre for 1917, 1918, and 1919. Soybean hay is included.
317. New Jersey Agricultural experiment station. Rye straw and soybeans. N. J. Agr. Expt. Sta. Rept. (1914) 35: 204-205. New Brunswick, 1915.  
Thirty-fifth annual report of the New Jersey State Agricultural Experiment Station, and the Twenty-seventh annual report of the New Jersey Agricultural College Experiment Station.  
The report of the Department of Farm Crops, includes a summary report for soybeans, showing total value of crop, total cost, total profit, average cost and profit per acre and average yield per acre, in a growing of rye straw followed by soybeans for seed as a two-crop proposition.
318. New Jersey Agricultural experiment station. Soy beans for seed. N. J. Agr. Expt. Sta. Rept. (1913) 34: 403-405. New Brunswick, 1914.  
Thirty-fourth annual report of the New Jersey State Agricultural Experiment Station and Twenty-sixth annual report of New Jersey Agricultural College Experiment Station.



The report of the Department of Farm Crops gives figures on value of crop, total cost, total profit, and average profit per acre.

319. Osterberger, C. L. Producing corn and soybeans with mechanical power. Agr. Engin. 10(6): 201-202. June 1929. 58.8 Ag83  
"Paper presented at a joint meeting of the Southern and South-west Sections of the American Society of Agricultural Engineers at Houston, Texas, February, 1929."  
"The object of the study was to determine the practicability and economy of tractors and tractor equipment in producing corn and soybeans on the alluvial or bottom lands of Louisiana..."  
Power and labor costs for producing the crops are discussed and summarized in a table.
320. Osterberger, C. L. Utilization of power and power equipment in corn and soybeans. Assoc. South. Agr. Workers Proc. (1929) 30: 44-48. Atlanta, Ga., 1929. 4 C82  
"The object of the study...is to determine the practicability and economy of tractors and tractor equipment in producing corn and beans on our alluvial or bottom lands..."  
Equipment used and costs per acre in labor and power are discussed. Table I. Labor and power summary, gives costs for various operations.
321. Phillips, Thomas D. Soybeans in rotation. Ohio Farmer 137(13, whole no. 3550): 455. Mar. 25, 1915. 6 Oh3  
An account of an experiment at the Ohio State University farm in 1915. Includes a statement of the labor costs to produce the crop.
322. Rauchenstein, Emil, and Ross, R. C. Cost of producing field crops in three areas of Illinois, 1913-1922. Ill. Agr. Expt. Sta. Bull. 277, pp. 37-67. Urbana, 1926.  
Table, p. 44, gives a "Summary of cost accounts on crops, Franklin county, 1913-22", which includes data for soybean hay, 1920-22; and table, p. 48, gives a "Summary of cost accounts on crops, Champaign and Piatt counties, 1920-1922", which has figures for soybeans for 1922.
323. Ross, R. C. Soybean costs and production practices. Ill. Agr. Expt. Sta. Bull. 428, pp. 341-388. Urbana, 1936.  
"The present study was...undertaken in order to ascertain what the detailed costs are that enter into the production of this crop on Illinois farms; the effects which different practices used in growing and harvesting have upon yields and costs; and the probable place of soybeans in corn-belt farming."

324. Rozul, J. B. Cost of production of soy bean (*glycine hispida*). Philippine Agr. 26(5): 475-476. October 1937. 25 P542  
Abstract by Felix J. Madrid, of thesis presented for the degree of Bachelor of Agriculture no. 675; Experiment Station contribution no. 1192.  
This is the cost of production under Los Baños conditions.
325. Soybean grower combines at low cost. Wisconsin Agriculturist and Farmer 58(40): 12-13. Oct. 3, 1931. 6 W751  
Contains cost figures of 1930 soybean crop of 80 acres of one farmer in Illinois.
326. Young, E. C., and Hobson, L. G. Costs and profits in producing soybeans in Indiana. Ind. Agr. Expt. Sta. Bull. 306, 28pp. Lafayette, 1926.  
"...This study was made with the purpose of determining the most economic methods of producing soybeans for grain and hay and also to determine to what extent soybeans could be profitably fitted into the general farming plan...  
"One hundred and four farmers furnished detailed information upon costs and methods of soybean production on their farms for the 1923 crop. One hundred and seventy-seven farmers furnished similar information for the 1924 crop...In addition to securing the dollar costs of soybean production care was taken to obtain quantities of labor and materials used in order that the study might have a permanent value...  
"The farms studied were located in ten counties in central Indiana as shown by the map (Figure 1)."
327. Young, E. C., and Hobson, L. G. Costs and profits in producing soybeans in north central Indiana, crop of 1923. Ind. Purdue Univ. Dept. Agr. Ext. Leaflet 144, 6pp. Lafayette, 1926.  
The leaflet brings out certain facts of value to soybean producers, from a study of "detailed cost records for the soybean crop of 1923...obtained on 104 farms in Cass, Carroll, Howard and Miami counties, by the Purdue University Agricultural Experiment Station".

#### GRADING AND STANDARDIZATION

328. Barr, J. E. Marketing soybeans basis U. S. standards. 6pp., processed. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, 1932. 1.9 Ec712Ms  
Address delivered at the annual meeting of the American Soybean Association, Washington, D. C., September 3, 1932.  
The writer reviews the construction of the standards, and describes the work of the soybean inspection service of the Bureau



of Agricultural Economics, the export of soybeans and the problems which arise, the handling of soybeans through terminal elevators, and suggested changes of U. S. standards.

A part of this article is printed in the Grain and Feed Jours. Consolidated 69(7): 346. Oct. 12, 1932, under the title: Proposed Changes in Soy Bean Grades Analyzed. 298.8 G762

Essentially the same material is printed in Grain and Feed Jours. Consolidated 72(2): 74. Jan. 24, 1934, under the title: Marketing Soybeans. 298.8 G762

329. Barr, J. E. Soy-bean standards promulgated for commercial crop. U. S. Dept. Agr. Yearbook, 1926, pp. 675-676. Washington, D. C., 1927.

"With the commercial supply of a comparatively new agricultural product increasing there naturally arises a problem in marketing. Although there may be an adequate outlet or market for the crop, a definite basis for price quotations is essential in order to insure more equitable returns to the producer and to expedite movement of the crop from the farms. Uniform quality standards are the key to the solution of this problem." - p. 675.

330. Chicago inspectors licensed to sample soy beans. Grain Dealers Jour. 63(11): 754. Dec. 10, 1929. 298.8 G76

The rapid growth of Chicago as a soybean market, the licensing of inspectors from the Chicago Board of Trade Sampling Department by the federal government, the increase in uses for the soybean, and the uses for the oil and meal are discussed.

331. Definitions of soybean products. Grain & Feed Jours. Consolidated 69(10): 473. Nov. 23, 1932. 298.8 G762

Gives the definitions adopted for standard soybean products at the annual meeting at Chicago of the National Soybean Oil Manufacturers Association.

332. Minneapolis. Board of grain appeals. Minnesota grain grades for the 1937-38 crop year as established by the Minnesota Boards of grain appeals. 47pp. [Minneapolis, Minn., 1937] Pam. Coll. (Grain Grades. Minnesota)

These standards are the same as the Federal ones.

333. New Soybean com'ite of Nat'l ass'n. Grain & Feed Jours. Consolidated 76(3): 111. Feb. 12, 1936. 298.8 G762

"S. W. Wilder, pres. of the Grain and Feed Dealers National Ass'n, has appointed a soybean com'ite...

"The com'ite will look into the charge of \$4 for federal appeal on soybeans, compared with \$1.50 for appeal on grains, will consider the transfer of soybean grading from the hay, seed and feed service to the grain division of the Bureau of Agricultural Economics, a change in the rules for grading, and the establishment of a futures market."

334. Soya bean standards are proposed by U. S. bureau. Oil, Paint and Drug Reporter 106(18): 20. Oct. 27, 1924. 306.8 0i5  
"Tentative gradings for soya beans have been issued by the Bureau of Agricultural Economics, United States Department of Agriculture...in the hope that they will be tried out in connection with the marketing of this year's crop, and in order to get data on possible revision of the tentative standards before they are officially and finally promulgated for application to next year's crop."
335. Soy-bean adulteration. Country Gent. 90(35): 52. September 1925.  
6 C833  
An account of the South Carolina false-label soybean seed fraud.
336. Soybean inspection to remain separate from Grain grades act. Grain & Feed Jours. Consolidated 76(6): 228. Mar. 24, 1936. 298.8 G762  
"The resolutions adopted by the Illinois Farmers Grain Dealers Ass'n and the Indiana Grain Dealers Ass'n urging that soybean inspection be placed under the Grain Standards Act have been considered by A. G. Black, chief of the Buro of Agricultural Economics, who explains in a letter to Fred K. Sale, sec'y of the Indiana Ass'n that the placing of soybean grading under the same authority would require an amendment to the Act." Mr. Black's letter is given in part.
337. Soybeans and their inspection. Grain & Feed Jours. Consolidated 66(5): 321. Mar. 11, 1931. 298.8 G762  
The inspection of soybeans through the U. S. Bureau of Agricultural Economics is discussed, and the need for developing new uses for soybean oil and meal is pointed out.
338. U. S. Department of agriculture, Bureau of agricultural economics. Handbook of official hay standards...revised, effective April 1, 1936. 62pp. Washington, U. S. Govt. print. off., 1936. (Form HFS-540-Rev.) 1 Ec7Ha  
Soybean and Soybean Mixed Hay, pp. 29-31, has class and grade requirements for soybean hay.
339. U. S. Department of agriculture, Bureau of agricultural economics. Handbook of official United States standards for soybeans, effective September 3, 1935. 20pp. Washington, U. S. Govt. print. off., 1935. (Form HSF-1663) 1 Ec7Hs 1935  
Contents: Promulgation of standards, p. 1; Definitions, pp. 2-3; Classes of soybeans, p. 4; Grade requirements, p. 5; Important features of official United States soybean standards, pp. 6-11; Application of official United States soybean standards, p. 11; Federal soybean inspection service, pp. 11-20 (includes discussion of Federal-State inspection, qualifications of inspectors, federal soybean inspection certificates, methods of inspection, methods of sampling, soybean triers or probes, appeal



inspection, who receives certificates, fees and charges, and how to obtain inspection).

Earlier editions of the standards were issued in 1928 (as Handbook of United States standards for soybeans effective September 1, 1926. 20pp. Washington, U. S. Govt. print. off., 1928. (Form HSF-899) 1 Ec7Hs) and in mimeographed form in 1924 (as Tentative Grades for Soybeans. 4pp., processed. Washington, D. C., Oct. 1, 1924); in 1925 (as United States Standards for Soybeans. Effective September 1, 1925. 3pp., processed. [Washington, D. C., 1925]). This was revised, effective September 1, 1926. 3pp., processed. Washington, D. C., 1926; and again, effective September 3, 1935. 3pp., processed, under title: Official Standards for Soybeans (HFS-1663). 1.9 Ec74So

340. U. S. Department of agriculture, Bureau of agricultural economics. Soybean appeal inspection procedure... 3pp., processed. [Washington, D. C., Sept. 15, 1937] 1.9 Ec712Sos

Instructions for soybean shippers, dealers and processors, giving procedure in handling appeals under the Federal soybean inspection service.

341. U. S. Department of agriculture, Bureau of agricultural economics. Soybeans inspected by federal licensed inspectors. 1p., processed. Washington, D. C., 1932-1934. 1 Ec712So

These have appeared for Dec. 7, 1932; March 9, 1933; Dec. 6, 1933; and April 6, 1934.

Contain statistics giving soybeans inspected for export and at interior markets, though figures for export not always given.

342. U. S. Department of agriculture, Bureau of agricultural economics. Tentative United States standards for soybean and soybean mixed hay, issued November 1928. 1p., processed. [Washington, D. C., 1928.] 1.9 Ec74So

"These standards have been prepared for the purpose of providing a definite basis of quality for use in marketing of Soybean and Soybean Mixed Hay...Uniform standards will assist materially in stabilizing the industry, in promoting better production methods, and in developing more extensive marketing of Soybean and Soybean Mixed Hay in regions of present or potential surplus production. Such use will demonstrate the practicability of these standards before they are made a part of the Official Hay Standards of the United States."

#### HARVESTING

343. Alabama. Agricultural experiment station, Department of agronomy and soils. Soybeans. Ala. Agr. Expt. Sta. Leaflet 2, 4pp. Auburn, 1934.

Harvesting, pp. 3-4.

344. Albrecht, William A. When to cut soybean hay. Successful Farming 28(8): 9. August 1930. 6 Sul2  
"The proper season for making soybean hay is that time when the pods are formed and just beginning to fill."
345. Beeson, K. E. Solving "soy" problems. Ind. Farmer's Guide 87(37): 773. Sept. 12, 1931. 6 In2  
"When and how to harvest is important in handling this hay and bean crop."
346. Bledsoe, R. P. A grille for threshing soybean selections. Ga. Agr. Expt. Sta. Circ. 85, 4pp. Experiment, 1929.  
The writer describes the grille, and its construction. Illustrations are included.
347. Borst, H. L., and Thatcher, L. E. Life history and composition of the soybean plant. Ohio Agr. Expt. Sta. Bull. 494, 96pp. Wooster, 1931.  
Literature cited, pp. 95-96.  
Part II. Yield and composition of soybeans at various stages of maturity, by L. E. Thatcher, pp. 51-94. It is stated that "Soybeans may be harvested for hay at several stages of maturity. The stage of maturity may affect the yield, quality, and composition of the hay and the weight and composition of the roots and stubble remaining in the soil. The effect of time of harvest upon these factors was investigated at Wooster during the 6-year period 1922-1927, inclusive."
348. Briggs, George M. Making soy bean hay. Hoard's Dairyman 68(5): 101, 118. Aug. 15, 1924. 44.8 H65  
Methods of harvesting the soybean crop for hay are discussed.
349. Cates, J. Sidney. New stunts in harvesting soys. Cheaper ways to handle the job are being worked out. Country Gent. 88(28): 5, 30. July 14, 1923. 6 C833  
"This is one of a series of articles gathered...from every part of the United States...for the purpose of suggesting to farmers ways of increasing their income." - Note.
350. Combining soybeans in the South. Atlantic seaboard states find use for the combine. Amer. Thresherman 33(8): 7. December 1930. 58.8 Am32  
The article quotes statements by D. S. Weaver of the North Carolina State College, Ray W. Carpenter of Maryland, and B. G. Locher of Virginia on the harvesting of soybeans, and the tests conducted by Prof. D. C. Heitshu of the Virginia Experiment Station are mentioned.
351. Cutler, G. H. Improvement for soybean bar cylinder thresher. Amer. Soc. Agron. Jour. 25(5): 362-363. May 1933. 4 Am34P



"A soybean bar cylinder thresher, a description of which appeared in this Journal, Volume 21, pages 377-378, has been improved so as to increase its general efficiency. Some of the improvements that have been effected are as follows..."

352. Cutting and threshing soybeans. Slow cylinder speeds recommended. Amer. Thresherman 28(3): 7. July 1925. 58.8 Am32  
Methods used in harvesting hay and seed are outlined.
353. Dunton, H. L., and Meggee, C. R. Curing soy bean hay. Mich. Agr. Expt. Sta. Quart. Bull. 16(4): 254-257. East Lansing. May 1934.  
Describes various methods of curing and the results secured from each.
354. Farver, Warner E. Soy beans for seed. Natl. Stockman and Farmer 43(24): 646. Sept. 13, 1919. 6 N21  
Describes harvesting methods of soybeans for seed.
355. Gray, R. B. Combining soybeans in the South. Agr. Engin. 14(4): 93-94. April 1933. 58.8 Ag83  
"Paper presented at a meeting of the Power and Machinery Division of the American Society of Agricultural Engineers held at The Stevens, Chicago, November 1932."  
Gives the results of observations made in the Mississippi Delta by the United States Department of Agriculture Bureau of Agricultural Engineering "on the operation of typical 10 ft. grain combines, complaints having been made that these machines could not be used to harvest beans in that section."
356. Heitshu, D. C. Soybean harvesting methods in Virginia. Agr. Engin. 9(7): 209-214. July 1928. 58.8 Ag83  
Report of investigation conducted by the Virginia Agricultural Experiment Station and the U. S. Department of Agriculture to study "the comparative merits of the different soybean harvesting methods practiced during the season of 1927. The methods observed during this study were (1) the cut and thresh, (2) the row harvester, (3) the broadcast harvester, and (4) the combine."
357. Holm, C. A. Growing soybeans for hay. Mo. Agr. Col. Ext. Leaflet 26, 2pp. Columbia, 1928.  
Includes a paragraph on harvesting and curing for hay.
358. Hosterman, W. H. Harvesting and curing soy bean hay. Natl. Hay Assoc. Rept. (1935)42: 26-31. 286 N21  
The history of the soybean as a hay crop, its value as an emergency hay crop, and methods of harvesting and curing it are given.  
A brief discussion follows the paper.

359. Juday, C. B. Development of combine reduces soybean losses. Purdue Agr. 29(1): 1, 9. October 1934. 6 P97  
Gives advantages of using the combine and costs of harvesting with it.
360. Justice, J. L. Cutting and threshing soy beans. Country Gent. 84(8): 60. Feb. 22, 1919. 6 C833  
Methods of carrying out the process.
361. Justice, J. L. Methods of cutting soy beans. Hoard's Dairyman 58(3): 90. Aug. 8, 1919. 44.8 H65  
Advantages and disadvantages of various methods.
362. Justice, J. L. Saving soy bean crop. Orange Judd Farmer 63(8): 2, 7. Aug. 25, 1917. 6 Orl  
Harvesting and threshing methods are outlined.
363. King, B. M. Soybean hay production. Mo. Agr. Col. Ext. Circ. 336, 4pp. Columbia, 1936.  
Harvesting soybeans for hay, pp. 3-4.
364. Lehmann, E. W., and Blauser, I. P. Combines in Illinois. Ill. Agr. Expt. Sta. Circ. 316, 16pp. Urbana, 1927.  
Points out among other things, the savings in harvesting soybeans with the combine, and offers a table showing the amount and quality of crops, including soybeans, harvested with fifty-two combines in Illinois in 1926.
365. McCuen, G. W. Hints for soybean threshing. Ohio Farmer 152(8, whole no. 3933): 158. Aug. 25, 1923. 6 Oh3  
"While the acreage of soybeans in Ohio has increased greatly during the past year, the threshing facilities in the field have not kept any where near abreast with the increased acreage." The power required in threshing beans and other considerations are taken up.
366. Martin, Brice. Harvesting soybeans. Small combine harvester cuts loss in threshing. Wallaces' Farmer 50(47): 1522. Nov. 20, 1925. 6 W15  
Percentages lost in harvesting with different machines are cited.
367. Mayer, I. D. Harvesting soybeans with the combine. Agr. Engin. 10(2): 52. February 1929. 58.8 Ag83  
"A contribution to the symposium, entitled 'New Developments in Combine Harvesting and Grain Drying,' presented at a meeting of the Power and Machinery Division of the American Society of Agricultural Engineers, at Chicago, December, 1928."  
Advantages of the combine for harvesting soybeans are cited. It is said to save more beans, result in a higher quality product, and reduce costs of harvesting.



368. Miller, E. E. When the soy beans are harvested. Country Gent. 82(28): 1141. July 14, 1917. 6 C833  
Harvesting methods are discussed.
369. Morse, William Joseph. Harvesting soy-bean seed. U. S. Dept. Agr. Farmers' Bull. 886, 8pp. Washington, D. C., September 1917. 1 Ag84F  
The author discusses the advantages of the soybean as a seed crop, the methods of harvesting, the methods of curing and handling, threshing, special bean harvesters, the value of soybean straw, and the storage of seed.
370. Mumm, Walter J., and Winter, Floyd L. A bar-cylinder soybean thresher. Amer. Soc. Agron. Jour. 21(3): 377-378. March 1929. 4 Am34P  
Describes a thresher built at the Illinois Agricultural Experiment Station to meet the need for one that "would thresh out the beans without any loss, and at the same time would avoid any mixtures or seed injury."
371. New harvester-thresher solves problem. Power Farming 35(10): 8, 12. October 1926. 58.8 T41  
This is a description of "a new type of power-driven combine soybean harvester" which was demonstrated at the Delta Experiment Station, Stoneville, Mississippi, before the American Soybean Association's 7th annual field meeting. The harvester makes it possible to harvest "25 to 35 acres of soybeans in a ten hour day."
372. Oldenburg, F. W. Soybeans for hay and seed. Md. Agr. Col. Ext. Circ. 106, 8pp. College Park, 1934.  
Harvesting soybeans for seed, p. 7; Threshing, p. 7; Special soybean harvesters, p. 8.
373. Park, J. B. Harvesting soybeans for seed. Ohio Agr. Col. Ext. Serv. Crop Talk 1, [4]pp. Columbus, 1923. 275.29 Oh33  
Takes up the time of harvesting, methods of harvesting, special soybean harvesters, threshing, and storage of seed.
374. Pate, W. F. Soybean harvesters. N. C. Agr. Col. Ext. Circ. 56, 8pp. Raleigh and West Raleigh, 1917.  
Description, with numerous illustrations, of machines suitable for harvesting soybeans.
375. Pate, W. F. Soybean harvesters. N. C. Agr. Col. Ext. Circ. 80, 8pp. Raleigh and West Raleigh, 1918.  
This circular is similar in material to Extension Circular 56, 1917, but contains in addition questions and answers on six types of harvester given in tabular form.

376. Reynoldson, L. A., Humphries, W. R., and Martin, J. H. Harvesting small grain, soybeans, and clover in the corn belt with combines and binders. U. S. Dept. Agr. Tech. Bull. 244, 55pp. Washington, D. C., 1931. 1 Ag84Te

"It is the purpose of this bulletin to present the necessary data and to make comparisons between different harvesting methods in order to assist farmers who are considering the purchase of a combine for harvesting their various crops. The information on which the comparisons are based was obtained from farmers in Illinois, who operated combines or binders, by the United States Department of Agriculture, cooperating with the agricultural colleges and experiment stations of Illinois and Indiana." - p. 2.

Contains statistical tables, among which is one showing charges per acre for harvesting different crops with different methods (including soybeans).

377. Reynoldson, L. A. Harvesting soy beans. A radio talk delivered through Station WRC and 31 other stations associated with the National Broadcasting Company, September 9, 1929. 2pp., processed. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Division of farm management and costs, September 9, 1929. 1.9 Ec7Ra

Results and costs of harvesting with the combine.

378. Simpson, W. F. An economic study of methods of harvesting soybeans for seed. Amer. Soc. Agron. Jour. 17(9): 557-567. September 1925. 4 Am34P

"Contribution from the Department of Agronomy, Virginia Polytechnic Institute, and Agricultural Experiment Station, Blacksburg, Virginia. Abstract from minor thesis submitted in partial fulfillment of the requirements for the degree of Master of Science..."

Literature cited, p. 567.

"The object of this investigation, conducted in 1924, was to study soybean harvesting methods and equipment with special reference to: (1) waste of seed in harvesting, (2) cleanliness of the seed saved, (3) damage to the seed, (4) rate of harvesting, (5) cost of harvesting, and (6) the factors affecting successful harvesting."

379. Swingle, F. B. Machines increase soy bean profits. Amer. Thresherman 32(8): 4. December 1929. 58.8 Am32

"Growers in Champaign, Piatt, and other [Illinois] counties where soy bean acreage is greatest in extent, have demonstrated what modern tillage and harvesting machinery will do to reduce time and labor spent in planting and harvesting, at the same time insuring more efficient seasonable plowing, seed bed preparation, planting and harvesting."

380. Uhland, R. E. Time of harvesting soybeans in relation to soil improvement and protein content of the hay. Mo. Agr. Expt. Sta. Bull. 279, 28pp. Columbia, 1930.



"The recent increase in the soybean acreage in Missouri, the possible future increase, and the irregularity in times of harvest indicate the necessity of knowing something about the yield and composition of soybeans at different stages of growth as a means of determining the proper time to harvest soybeans for maximum results in terms of hay, seed, and soil improvement." The tests reported include the results of four years work from 1924-1928.

381. U. S. Department of agriculture. Handy helps in harvesting soy beans increase crop's food and forage value. U. S. Dept. Agr. Weekly News Letter 7(10): 6. Washington, D. C. Oct. 8, 1919. 1 Ag84W

"With the widely increased popularity of the soy bean the harvest of the crop has gained markedly in importance in practically every section of the country. According to specialists of the United States Department of Agriculture the fact that practical and satisfactory bean harvesters are now on the market at comparatively reasonable prices and are efficient for harvesting the crop either when grown under level or ridged-row methods of cultivation, greatly increases the value of this crop not only as a forage for live stock but also for human food purposes."

Methods of harvesting are described.

382. U. S. Department of agriculture. Threshing and storing to save soy-bean seed. U. S. Dept. Agr. Weekly News Letter 7(17): 4. Nov. 26, 1919. 1 Ag84W

This article gives methods of threshing and storing the soy-bean seed so as to prevent deterioration and loss, since it is now "of considerable value."

383. Van Doren, C. A., and Burlison, W. L. Cutting soybean harvesting costs. Amer. Thresherman 34(5): 6, 11. September 1931. 58.8 Am32  
Harvesting with the combine was found to be cheaper under Illinois conditions than with the binder and grain separator.

384. W., J. The combine harvester moves to Iowa. How it is handling soybeans on the [Raymond] Warren farm in Wapello County. Wallaces' Farmer 51(46): 1474. Nov. 12, 1926. 6 W15

385. Weber, B. T. Soy beans for seed. Rural New Yorker 95(5355): 130. Feb. 8, 1936. 6 R88

Methods of harvesting the crop for seed are brought out.

386. Wettach, Melville. Soy beans for the Corn belt. Hoard's Dairyman 65(12): 434. April 6, 1923. 44.8 H65  
Includes a brief passage on harvesting the crop.

387. Wilkins, F. S. Harvesting and threshing soy beans. Wallaces' Farmer 45(39): 2243. Sept. 24, 1920. 6 W15

The grain binder is suggested for harvesting soybeans for seed.

388. Willard, C. J. Harvesting soy beans for hay. Hoard's Dairyman 70(6): 145. Aug. 21, 1925. 44.8 H65  
Methods of handling the crop are discussed.
389. Willard, C. J., Thatcher, L. E., and Park, J. B. Harvesting soybeans for hay. Ohio Agr. [Expt.] Sta. Bimonthly Bull. 175, pp. 148-154. Wooster, July-August 1935.  
The effect of time of cutting and method of curing on soybean hay are discussed.
390. Willard, C. J. Time of harvesting soybeans for hay and seed. Amer. Soc. Agron. Jour. 17(3): 157-168. March 1925. 4 Am34P  
"Contribution from Department of Farm Crops, The Ohio State University, Columbus, Ohio..."  
The study includes tables showing yields of soybeans at different periods of maturity, 1919-1922; and other data concerning soybeans at different periods of maturity, 1919-1922.
391. Williams, C. B. Harvesting soy beans. Prog. Farmer 33: 349. Mar. 16, 1918.  
Not examined.
392. Wolfe, T. K. Soybean culture. Va. Agr. Expt. Sta. Bull. 235, 32pp. Blacksburg, 1924.  
Harvesting for hay, pp. 24-26; Harvesting for silage, pp. 26-28; Harvesters, pp. 28-31; Comparison of soybeans and cowpeas, p. 32.

#### MARKETING

393. Begin trading in soybean futures. Grain and Feed Jours. Consolidated 77(7): 301. Oct. 14, 1936. 298.8 G762  
Describes the market at the opening on October 5th of the first future trading market in soybeans on the Chicago Board of Trade.
394. Blythe, Stuart O. Selling soys. Country Gent. 87(34): 7, 24. Sept. 30, 1922. 6 C833  
Contains a description of the methods used by the Linn County (Missouri) Soybean grower's association in selling soybeans.
395. Burns, C. C. Farmers to market soybeans. Illinois cooperative formed to handle crop. Wallaces' Farmer 55(3): 100-101. Jan. 18, 1930. 6 W15  
"A membership campaign to sign up the entire soybean crop in the highest producing region in the United States is the object of the new Soybean Marketing Association, organized and incorporated at Decatur, Ill..."



"The Association will begin the cooperative marketing of soybeans as a commodity with the 1930 crop."

The membership, organization, operation and general aims of the association are explained.

396. Chicago Board to vote on soybean futures. Grain & Feed Jours. Consolidated 77(6): 239. Sept. 23, 1936. 298.8 G762  
Describes the work and results of investigation by the committee appointed by the Chicago Board of Trade to study the desirability of establishing a futures market for soybeans.
397. Christian, C. F. Newton follows the in-and-out method. He aims to be in the market when other fellows are out. Successful Farming 24(1): 13, 78. January 1926. 6 Sul2  
C. B. Newton's methods of harvesting the soybeans and selling them by mail are described.
398. Clemmons, J. G. Soy bean marketing. Grain & Feed Jours. Consolidated 66(6): 375, 376. Mar. 25, 1931. 298.8 G762  
Abstract of address "before Illinois Farmers Grain Dealers Ass'n."  
Handling and conditioning the crop, the commercial position of the soybean, and the demand for seed are considered. It is stated that "we are now faced with the problem of setting up a regular channel such as we have in grains, thru which soybeans may be marketed."
399. Connecticut. Department of agriculture, Bureau of markets. Connecticut seed law rules and regulations with suggestions for the retailer, wholesaler and farmer by Francis H. Adams. Conn. Dept. Agr. Bull. 49, 27pp. Hartford, 1937.  
"Agricultural seeds" are defined as including soybean seed (p. 3).
400. Contracting soy beans. Grain Dealers Jour. 63(5): 335. Sept. 10, 1929. 298.8 G76  
Reproduces the contract forms to be used by the Archer-Daniels-Midland Co., of Minneapolis, Minn., and country grain elevator operators having soybean growers in their territory.  
"In effect and in fact this contract guarantees the grower of soy beans a definite price per bushel, which may encourage farmers to contract acreage that needs rotating and would normally go to oats."
401. Flax plantings smaller this year. Soya bean plantings for oil and meal will be 25% larger than in 1930. Chemicals 35(15): 21. April 13, 1931. 306.8 C42  
"The outlets for oil and meal will determine the extent to which the production of soybeans for milling purposes may profitably expand...There is but little hope of a marked increase in the market outlets for soybean products in the near future..."

402. James, Delos L. Teamwork helps Illinois farmers. Nation's Business 16(11): 106-107. October 1928. 286.8 N212

The writer describes the agreement entered into by the American Milling Co., of Peoria and allied interests and Illinois farmers "to buy 1,000,000 bushels of soy beans from this year's crop at a guaranteed price of \$1.35 for No. 2 beans, f.o.b. Peoria and Bloomington." This is a minimum price, at which the farmer is not required to sell if he can get more elsewhere for seed or commercial purposes, after first giving the Associated Companies a chance to buy at the higher prices offered. The plan thus guarantees a price to the farmer in advance of planting.

403. Johnson, E. F. Elevator men easily handle soybeans. Grain & Feed Jours. Consolidated 74(4): 162. Feb. 27, 1935. 298.8 G762

Abstract of address "before Indiana Grain Dealers Ass'n."

Elevator men are urged to handle soybeans and encourage the commercial growing of the crop in their territory.

404. Kansas. State grain inspection dept. Laws and rules of the Kansas State grain inspection and weighing department, governing inspection and weighing of grain, soy beans and flaxseed, together with their standards and grades. 62pp. Topeka, Printed by Kansas State printing plant, W. C. Austin, state printer, 1934. 280.359 K132L

Standards for soy beans, pp. 45-48, includes definitions, classes of soy beans, important features of U. S. soy bean standards, application of soy bean standards.

405. Lien-en, Tsao. The marketing of soya beans and bean oil. Chinese Econ. Jour. 7(3): 941-971. September 1930. 280.8 C442

The amount of Manchurian soybean production as compared with the other leading soybean producing countries, and a discussion of the marketing of soybeans, cake and oil on the world market, are included.

406. Lloyd, J. H. Soybean production and marketing. Ill. Farmers' Inst. Ann. Rept. (1931) 36: 112-120. 4 I162

In this talk are considered the importance of the soybean as a world crop, its utilization, processing methods, value of the oil and meal, contract buying of commercial beans as an important factor in the rapid development of the industry, the work and organization of the Soybean Marketing Association, its 1930 marketing deal, prices and production costs of soybeans, the co-operative marketing principles which are an object of the Soybean Marketing Association, the need for tariff protection, and the commercial soybean outlook.

407. McGuire, W. C. Growing and handling soybeans. Grain Dealers Jour. 64(4): 271. Feb. 26, 1930. 298.8 G76

Abstract of address "before Illinois Farmers Grain Dealers Ass'n."



The writer discusses the handling of soybeans "as an elevator proposition", and doubts that the contracts at present in use between growers and processors will last long. He expects a selling of soybeans on a purely supply and demand basis, and suggests tariff protection on the product.

408. Malott, Deane W. Problems in agricultural marketing. 410pp. New York, London, McGraw-Hill book co., 1938. 280.3 M29  
Ch. III. Organization and Operation of the Futures Exchanges, pp. 85-111, contains a section, pp. 98-105, on the establishment of the soybean futures market on the Chicago Board of Trade which became operative October 6, 1936.
409. National soybean processors association. Trading rules of the National soybean processors association. Rules to govern purchase and sale of soybean oil [1930-1937]. 14pp. [n.p., 1937?] 307 N21  
Includes rules and forms of contracts, standard specifications for purity and quality of crude domestic raw soybean oil, rules for quantity, price, terms of payment, inquiries and quotations, time of shipment and carrying charge, weights, routing, tank cars, commission or brokerage, arbitration, contingencies, and the amendment of these rules.
410. Norton, L. J. The soybean marketing outlook. Ill. Agr. Col. Ill. Farm Econ., nos. 28-29, p. 133. Urbana, September-October, 1937. 275.28 I15  
"The outlook information in this issue is based upon reports issued by the Bureau of Agricultural Economics, U. S. D. A." - Ed. note.  
It is pointed out that any material advances in soybean prices seem improbable unless Manchurian supplies are cut off, and with regard to price decline that "soybeans have been more stable in price in the last month than other grains, indicating a firmer basis under the market." Scarcity of lard might also keep up the price for vegetable oils, but "should the financial weakness continue as indicated by declining prices for securities, it will have a depressing influence on prices of both soybeans and corn."
411. P., C. Soybeans in the United States and Manchoukuo. Far East. Survey 4(18): 145-146. Sept. 11, 1935. 280.9 In782  
"There is every reason to believe that an export market may be developed in time. The American bean was favorably received in Europe, as the quality was considered very good. But the European demand is for a heavy constant tonnage, and it will probably be some years before the United States will have an export supply which can compete with that of Manchoukuo in quantity and price."

412. Pittman, Lawrence. Handling soybeans. Grain Dealers Jour. 62(3): 169. Feb. 10, 1929. 298.8 G76  
Abstract of an address before Illinois Farmers Grain Dealers Association at Joliet.  
Discusses contracts for soybeans being made between milling companies and elevators.
413. Setnitskii, N. A. Soya beans on the world market, with a supplement of an article in the English language: "Manchuria and the world market for soya beans." 335pp. Harbin, 1930. 60.3 Se7  
At head of title: Economic Bureau, Chinese Eastern Railway.  
Text and added t.-p. in Russian; English Suppl., pp. 309-355.  
Title of the supplement: Manchuria and the World Market for Soya Beans. The following footnote is appended: "The present article, in its considerable part, is the conclusion of a book named 'Soya Beans upon the World Market' by N. A. Setnitzky."  
The United States as a market for Manchurian soybean oil, is briefly mentioned, p. 318, and the increased area of soybeans under cultivation in the United States, is brought out, p. 325.
414. Soybean industry looks up. Producers organize co-operative to assist in developing new markets. Bur. Farmer (Ill. Agr. Assoc. Sec.) 5(3): 9-10. November 1929. 280.82 B89  
Describes the organization and methods of operation of the Soybean Marketing Association, and briefly mentions the grading of beans according to federal standards, the higher profits of soybeans over oats, and the development of new uses for soybeans.
415. Soybean sits pretty. Becomes so important that Chicago Board of Trade may establish futures trading. Business Week (362): 21-22. Aug. 8, 1936. 280.8 Sy8  
The uses for the soybean in industry, reasons for the increase in 1935 acreage, and competition of the oil with tung oil are mentioned.
416. Speculative soybeans. Grain & Feed Jours. Consolidated 78(1): 13. Jan. 13, 1937. 298.8 G762  
This is a discussion of the condition of soybeans on the Chicago futures market.
417. Steen, Herman. Taking out the gamble. Wallaces' Farmer 53(50): 1736. Dec. 14, 1928. 6 W15  
"Crop contracting was tried out on a large scale in Illinois this year with soybeans, based on a guaranteed price by three large buyers. This effort in price stabilization resulted in doubling the soybean acreage, netted the growers a substantial advance over prices prevailing in other years for commercial beans, and gave manufacturers enough beans to operate close to capacity for the entire year."



418. Stewart, Charles L., and Whalin, Oren L. Le commerce international des fèves de soya et de leurs sous-produits. *Revue Économique Internationale*, 25 année, v. 2, no. 3, pp. 543-562. June 1933. 280.8 R32

A discussion of international trade in soybeans and soybean products, in which are brought out the various uses for the soybean, trends in production and international trade, restrictions affecting international trade in the soybean and its products, and an estimation of the present and future international trade in them.

419. U. S. Congress, Senate Committee on agriculture and forestry. Amendment of Agricultural marketing act; hearing, 72nd cong., 1st session on S. 3680, a bill to amend the Agricultural marketing act approved June 15, 1929. February 18, 1932. 78pp. Washington, U. S. Govt. print. off., 1932. 280.3 Un37Am

Statement of Earl C. Smith, President Illinois Agricultural Association, pp. 58-65, includes discussion of the soybean crop, which, he says, has become "one of the big cash crops of the Midwest." He makes the following statement:

"Therefore, we believe that the equalization fee, from the standpoint of the exportable surplus, should be applied so as to make the tariff operative from the standpoint of controlling seasonal surpluses of these great cash crops. If cooperative marketing is to do the thing that I am sure is intended in law, we have got to arrange so that the charge for commodity control, surplus control, shall be spread over each unit of the commodity that is benefited."

#### OIL, PROTEIN AND MOISTURE CONTENT

420. Chiu, Y. T. A simple method for the determination of oil in soybeans or soybean milk. *Lingnan Sci. Jour.* 10(1): 130-131. April 1931. 22.5 C16

Includes percentages of oil found in six soybean varieties by this method as compared with the Soxhlet method.

421. Coleman, D. A., and Boerner, E. G. The Brown-Duvel moisture tester and how to operate it. U. S. Dept. Agr. Dept. Bull. 1375, 44pp., rev. Washington, D. C., 1927. 1 Ag84B

Issued February 1926; Revised December, 1927.

The testing of soybeans by this method is included.

Revised Methods for Operating the Brown-Duvel Moisture Tester, by D. A. Coleman, and H. C. Fellows. 4pp., processed. [Washington, D. C.] U. S. Dept. of agriculture, Bureau of Agr. Econ. [July 1935.] Supplement to Department Bulletin 1375.

422. Coleman, D. A. Efficiency of electric moisture testers. *Farmers' Elevator Guide* 33(2): 34-36. Feb. 5, 1938. 280.28 Am3

"To date the research work of the U. S. Bureau of Agricultural Economics has shown that the electric moisture meter is the nearest approach to a precise device and method for determining the moisture content of grain that is practical for a large majority of the moisture tests required by modern conditions of grain inspection and grain commerce."

This tester may be used for soybeans.

423. Coleman, D. A., and Fellows, H. C. Handbook of instructions for the installation and operation of the Tag-Heppenstall moisture meter. . . 93pp., processed, rev. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Grain division, July 1936. (USGSA-MB1-1 Revised) 1.9 Ec72Ha 1936

Part V. Special Problems in Moisture Testing, includes, p. 39, instructions for soybeans. Conversion charts XLII and XLIII, pp. 90-91, apply to soybeans.

424. Coleman, D. A., and Fellows, H. C. A simple method for determining the oil content of seeds and other oil-bearing materials. U. S. Dept. Agr. Tech. Bull. 71, 14pp. Washington, D. C., 1928. 1 Ag84Te

"In the search for a rapid, safe, and accurate test for the oil content of seeds and other oil-bearing materials for general use, the optical method applied to cottonseed products by Wesson was found most promising. The procedure necessary in the application of the optical method to a number of commodities was worked out in the grain-research laboratory of the Bureau of Agricultural Economics, and a standard practice for each is recommended. By this method determinations can be made in 15 minutes, at a cost for materials of less than 1 cent per test, which agree very closely with those obtained by the standard ether-extraction method." - Summary, p. 13.

The test is used for soybeans as well as other grains.

425. Cox, C. H. Soy bean analysis. Oil and Soap 13(7): 167-168. July, 1936. 307.8 J82

Paper presented at the Spring Meeting of the American Oil Chemists' Society, New Orleans, May 28 and 29, 1936.

Describes the analysis of soybeans for oil mill purposes, including moisture determination, ammonia determination, oil content, free fatty acid content and the final calculation of results. A sample analysis is given.

426. Ginsburg, Joseph M., and Shive, John W. The influence of calcium and nitrogen on the protein content of the soybean plant. Soil Sci. 22(3): 175-197. September 1926. 56.8 So3

"Paper No. 273 of the Journal Series, New Jersey Agricultural Experiment Station, Department of Plant Physiology."



"The purpose of these experiments is, therefore, two-fold: First, to determine whether there exists a definite relation between calcium and nitrogen in plant metabolism. Secondly, to ascertain whether the increased nitrogen found in plants as a result of lime application is in the form of protein or non-protein nitrogen."

427. Hall, Wallace L. Some analyses of commercial soybeans. 5pp., processed. [Washington, D. C.] U. S. Dept. Agr. Bur. Agr. Econ. [1937].  
1.9 Ec712Ss

"Presented before the Paint and Varnish Division of the American Chemical Society at Chapel Hill, North Carolina. April 12-15, 1937."

"Literature cited", p. 5.

"In the final analysis the chemical research data should substantiate inspection procedures which, by necessity, must be simply and quickly applied. That is, those quality factors used by the inspector in standardization practice must stand trial and prove their merit as against such evidence of quality as may be obtained through the longer and more complicated physical and chemical analyses. The method of approach to the problem under discussion has been to separately analyze split, damaged, and whole sound beans and compare the data. In this paper the data relate primarily to certain chemical studies upon crude oil and, to a lesser extent, upon crude protein obtained from the general run of commercial soybeans."

Includes tables and maps.

428. Jamieson, G. S., Baughman, W. F., and McKinney, R. S. Oil content of nine varieties of soybean and the characteristics of the extracted oils. U. S. Dept. Agr. Jour. Agr. Research 46(1): 57-58. Washington, D. C., Jan. 1, 1933. 1 Ag84J

Gives the results of an investigation in a table: Chemical and physical properties of soybeans and their oils.

429. Jolson, L. Dosage de l'humidité dans les fèves de soja. Mémoires de l'Université d'Etat à l'Extrême-Orient. 13(6): 1-23. 1929.  
Not examined.

"From a study of drying at 100-5° and at 120-60°, of distn. in presence of xylene, and of the effects of the fineness of grinding, wt. of samples and temp. and time of drying, J. concludes that all 3 methods give satisfactory results provided the conditions are properly selected and strictly adhered to. He recommends grinding to pass a 1.5-2.5 mm. mesh sieve and drying 5 g. for 20 min. at 130°. Drying at 100-5° requires 5-8 hrs. and should not be continued to const. wt." - Chem. Abs. 25: 2207. May-August 1, 1931.

430. Jones, D. Breese, and Csonka, Frank A. Soybeans content of amino acids varies greatly with variety. U. S. Dept. Agr. Yearbook, 1934: 330-332. Washington, D. C., 1934. 1 Ag84Y  
"Recent studies in the Bureau of Chemistry and Soils on the proteins of soybeans have disclosed the fact that different horticultural varieties of the same seed may show differences in the amino acid composition. In view of the great increase in the production of soybeans in the United States during recent years, any significant difference in the food value of one variety over another becomes a matter of importance."
431. Lebedev, A. N., and Pereverzeva, T. V. Methoden der feuchtigkeitsbestimmung in sojabohnen. Moscow. Zentrales Biochemisches Forschungsinstitut der Nahrungs- und Genussmittelindustrie. Schriften 1(5): 200-210. 1931. 389.9 M85  
Text in Russian. Alternate titles and summary in German.  
Describes methods for the determination of moisture in soybeans.
432. Lebedev, A. N., and Alexandrow, W. Die vergleichenden untersuchungen über die methodik der asche- und phosphorbestimmung in den sojabohnen. Moscow. Zentrales Biochemisches Forschungsinstitut der Nahrungs- und Genussmittelindustrie. Schriften 1(6): 265-284. 1932. 389.9 M85  
Text in Russian. Alternate titles and summary in German.  
Comparative researches on the procedure for determining ash and phosphorus in soybeans.
433. Leith, B. D. Fluctuating variations in the soy bean. Amer. Soc. Agron. Jour. 16(2): 104-108. February 1924. 4 Am34P  
"The interesting fact is that in oil and protein content and in iodine number, the fluctuations from year to year have been large, and that only within rather wide limits have they been consistent in a certain direction between varieties in a single year..."  
Observations were made on results in varietal experiments at the Wisconsin University Department of Agronomy, begun in 1911.
434. Lipman, Jacob G., Blair, Augustine W., McLean, Harry C., and Wilkins, Louis K. Factors influencing the protein content of soy beans. N. J. Agr. Expt. Sta. Bull. 282, 14pp. New Brunswick, N. J., 1914.  
"Part of this material appears in the annual report for 1913-1914." N. J. Agr. Expt. Sta. Ann. Rept. (1914) 35: 207-245. 1915.  
"During the summer of 1914 a number of pot experiments were conducted to determine the influence of different factors, as for example, fertilizer treatment, thickness of planting, time of harvesting, etc., on the protein content of soy beans..."



435. Lipman, Jacob G., and Blair, A. W. Factors influencing the protein content of soybeans. *Soil Sci.* 1(2): 171-178. February 1916. 56.8 So3  
Continuation of work begun in summer of 1914, an account of which was given in the Annual Report of the New Jersey Experiment Station for that year.
436. McKinney, R. S., Cartter, J. L., and Jamieson, George S. The determination of the oil content of soybeans. *Oil and Soap* 11(12): 252, 261. December 1934. 307.8 J82  
"A contribution from the Oil, Fat and Wax Laboratory, Bureau of Chemistry and Soils, and Division of Forage Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture."  
"It is concluded from the results of this investigation that the double extraction of the undried ground sample with petroleum ether is the only reliable procedure available for the determination of the oil content of soybeans."
437. Mashino, Minoru. Studies of the soya-bean proteins. *Soc. Chem Indus. Jour. Trans.* 54: 236T-238T. July 12, 1935. 382 M31  
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"The investigations reported here were made with southern soybean varieties grown under southern conditions in an effort to determine how characteristics, including fat constants, of such varieties may differ and how they may be changed by stage of maturity when harvested and by decay." - Introduction, p. 1.  
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Permissive principles for protein and oil-testing service, p. 44, concludes that "An effective protein and oil-testing service, accompanied by comprehensive protein surveys of the wheat crops and oil surveys of the flaxseed and soybean crops and by a market-news service pertaining to protein and oil premiums, supplies, and market requirements, should be of distinct benefit to the grain industry, especially to producers and country shippers."

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"...The tables of trade have been prepared by Mario Costa."  
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"...The second part (pages 403-506) comprises recapitulatory

tables of area and yield of the chief oil yielding crops, and the trade data of their products and of vegetable oils."

General Survey of the Principal Crops: Soya Beans, pp. XX-XXI.

Production and utilization of the soya in the United States are given, pp. 140-141; production of soy oil, 1914-1918, p. 144; imports of soy oil, 1911-1922, p. 146; exports 1919-1922, p. 147; re-exports 1911-1922, p. 147.

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449. Chemical and material markets in 1923: Soya bean oil. Chem. and Metall. Engin. 30(3): 113. Jan. 21, 1924. 381 E12

Gives figures on imports of crude soybean oil in pounds, by months with comparison with 1922, and tank-car prices paid for crude soybean oil, per pound, by months in 1923.

450. Faure, Blattman & Co. Review of the oil and fat markets, 1923-1936. 14v. [London, Eng., 1924-37.] 307 F27

Statistics are presented for monthly prices of soybeans (in the United Kingdom), imports and exports of oil and beans for the chief countries, including the United States.

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451. Gray, George Douglas. The soya bean in international trade. Foreign Affairs 13(2): 340-342. January 1935. 280.8 F76

Statistics are given of soybean production in the chief producing countries, the Manchurian soybean trade, 1907-1932, Manchurian exports, 1927-1932, and imports of soybeans and oil into the chief importing countries, 1930 and 1932. The effect of increased production in the United States upon the Manchurian trade is brought out.

452. International yearbook of agricultural statistics, 1910-1937/38. 29v. Rome, Printing office of the International institute of agriculture, 1912-1938. 251 In84

At head of title of the 1910 issue: Institut international d'agriculture. Bureau de la statistique générale. - 1911/12-1920/21, 1923-1925/26, Institut international d'agriculture. Service de la statistique générale. - 1922. International institute of agriculture. Bureau of general statistics. - 1926/27-International institute of agriculture.

For the following statistics on soybeans, see indexes of the volumes indicated: international trade in soybeans and soybean oil, 1925/26-1937/38, (generally for the four latest years, with



comparisons); imports and exports of soybeans and soybean oil, 1925/26-1926/27, 1928/29 (1928/29 gives sum totals of net exports over imports, including soybeans and oil, and excess of imports over exports, including soybeans); area, production and yield per hectare of soybeans in the chief producing countries, 1932/33-1937/38.

453. Kirjassoff, Max D. Vegetable-oil-bearing materials of Manchuria. U. S. Dept. Com., Bur. Foreign and Dom. Com. Com. Repts. 161, pp. 180-185. July 10, 1920. 157.7 C76D  
Includes tables (p. 184) showing the exports of bean-cake and bean-oil to the United States in tons, October 1918 to September 1919, and mentions (p. 185) the increasing demand for the oil in the United States.
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Text in French and English.  
1930/31 has title: Statistical Year-book of the League of Nations. Issued by Economic Intelligence Service.  
1934/35-1936/37 have title: Statistical Year-book.  
Exports of soybeans from main producing countries are given in the volumes 1926-1930/31; Cultivated area, production and yield in the various producing countries are included in the volumes 1931/32 on (Yield omitted in volumes 1935-1937). Consult index under soya beans.
455. Noll, Charles F., and Lewis, R. D. Soy beans. Pa. Agr. Expt. Sta. Bull. 167, 20pp. State College, Centre County, Pa., 1921.  
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Tables include those showing the average yields per acre of seed of varieties of soybeans, 60 pounds per bushel, average yields per acre of field cured hay of varieties of soybeans, comparison of yields of crops in the oats rotation and in the soybean rotation, feeding values of oats and of soybeans grown on alternate plots 1913-1920, a comparison of the farm values of oat grain and soybean seed, and digestible nutrients in average crops of soybean seed and straw and in soybean hay in the rotation experiment.
456. Over half million acres in soys last year. Orange Judd Farmer 71(5): 133. Mar. 1, 1923. 6 Orl  
"Through inquiry from every farm advisor in the state, and

from other information in each Illinois county, the agronomy department at the University of Illinois recently completed a state-wide survey to determine definitely the soybean acreage." The figures are given and explained.

457. Pope, Felix T. World trade in soy beans. Northwest. Miller 157(1): 54. Jan. 2, 1929. 298.8 N81  
Production, consumption, import and export statistics for the United States are given.
458. Soya bean oil. Chem. and Metall. Eng. 30(3): 113. Jan. 21, 1924. 331 E12  
This is a brief statistical summary of the industry for 1922 and 1923, including imports to the United States, tank car price in 1923 of crude soybean oil and importation of the oil in pounds, 1922-1923.
459. Soybean acreage in U. S. 100 times that of 1907. Oil, Paint and Drug Reporter 128(11): 24. Sept. 9, 1935. 306.8 O15  
Figures are given on acreage, consumption, and amount of oil used for paint and varnish, compounds and vegetable shortenings, other edible products, soap, linoleum and oilcloth, printing inks and miscellaneous products.  
This same article in abridged form appears in Indus. and Engin. Chem. (News edition) 13(18): 377. Sept. 20, 1935. 381 J825
460. Soybeans for oil and meal, 1932. Flour & Feed 32(10): 24. March 1932. 298.8 F66  
Figures are given for the commercial production of soybeans, the quantity crushed, and imports of soybean oil, cake and meal for 1931.
461. U. S. Department of agriculture. Agricultural statistics, 1936-37. 2v. Washington, Govt. print. off., 1936-37. 1 Ag84Yas  
Statistical material formerly published in the yearbooks of the Department of Agriculture is printed separately from 1936 on.  
The following statistics relating to soybeans are included in the statistical yearbooks for 1936-37: acreage, yield and production of soybeans; prices of crude soybean oil; international trade in beans and oil; imports of soybean oil; farm prices for soybeans; production of bean oil; market prices for the beans; wholesale seed prices; soybean cake and meal imports (1937 only); soybeans crushed; world production of soybeans.
462. U. S. Department of agriculture. Crops and markets, v. 1, Jan. 5, 1924-Dec. 31, 1926. 6v. Washington, [Govt. print. off.] 1924-27. 1 Ag84Wc  
This publication continues the weekly "Weather, crops, and markets."



...Monthly supplement, v. 1, suppl. no. 1-v. 3, January 1924-December 1926. 1 Ag84Wcm (See under U. S. Dept. of agriculture. Crops and markets. Monthly supplement.)

Monthly, v. 4, January 1927-v. 15, no. 5, May 1938. 1 Ag84Wcm Contains the data previously appearing in the weekly edition and the Monthly supplement, and continues volume numbering of the Monthly supplement.

Tables showing the following soybean statistics appear in this publication: acreage, yield, production, prices received by producers December 1 (various other dates in 1937 volume), and total value (appears in the December issues); monthly farm prices (U. S. average) 1913 to date given in December issues 1930 and later. (Similar tables for a shorter period of time appear in earlier issues); prices received by farmers, monthly U. S. averages (each issue 1933 and later); wholesale prices of field seeds, including soybean seed (vols. 1, 3, 5, weekly. See index); soybean prices and movement by states (vols. 1-3, 5-6, weekly. See index.); estimated crop conditions appear in July, August, September and October issues of 1931, July, August and September of 1933 and 1934, and August, September and October of 1935-1937; intentions to plant, March issues, 1933, 1935-1938; soybeans produced for grain, 1934 and later (See index); soybeans grown alone for all purposes, July issues 1935 and 1937; prices of feedstuffs, (including soybean meal) at important markets, monthly, 1937 and 1938; soybeans for beans, production in leading states, October 1937 issue; acreage of crops harvested, including soybeans, 1919-37 in December 1937 issue.

The December 1937 issue also contains soybeans for hay: acreage harvested, 1928-32, 1936, 1937; yield 1924-32, 1936, 1937; production 1928-32, 1936, 1937; soybeans grazed or plowed under 1928-32, 1936, 1937; soybeans for beans: Acreage harvested 1928-32, 1936, 1937; yield per acre 1924-32, 1936, 1937; production 1928-32, 1936, 1937; and cash income, 1936-1937; soybean acreage for all purposes, 1928-32, 1936-1937. Information in this last paragraph is all given by states.

463. U. S. Department of agriculture. Crops and markets. Monthly supplement, v. 1, no. 1-v. 3, no. 12. Washington, D. C., January 1924-December 1926. 1 Ag84Wcm

The following statistics for soybeans are included in each volume: Acreage, yield and production of soybeans by states (November 1924, and December 1925 and 1926); monthly farm prices, U. S. averages (December issues); retail soybean seed prices, by states (March issues); soybean shipments, stocks and prices, by states (compiled from shippers' reports) (March issues 1924 and 1925, April for 1926); soybean condition reports (July, August, September and October, 1925, and August, September and October, 1926).

464. U. S. Department of agriculture. Weather, crops and markets, v. 1, no. 1, Jan. 7, 1922-v. 4, no. 26, Dec. 29, 1923. Washington, D. C. [Govt. print. off.] 1922-23. 1 Ag84We

Combination of Market Reporter, the National Weather and Crop Bulletin, and the Monthly Crop Reporter.

Continued by Crops and Markets.

The following soybean statistics are included: v. 1, outlook and condition; farm value; wholesale prices of soybean seeds; v. 2, prices and movement; acreage, yield and prices; v. 3, prices, shipments and stocks, by states; wholesale seed prices at principle markets, weekly; v. 4, acreage, yield and prices, by states; prices and movement, by states; prices on farm, by months, 1913-23, U. S. averages; prices on farm in November, by states, 1922 and 1923.

Brief articles discussing the soybean situation are to be found through the indexes to these volumes.

465. U. S. Department of agriculture. Yearbook of the United States Department of agriculture, 1917-1935. 18v. Washington, D. C., 1918-1935. 1 Ag84Y

The following statistics relating to soybeans are given in the yearbooks of agriculture, 1917-1935: Soybean oil imported into the United States.

Farm prices for soybeans (yearbooks 1918-1921, 1923-1925); Acreage, production and value (yearbooks 1919-1921, 1923-1924, 1928, 1930-1935); Soybean oil exports (yearbooks for 1920-1925, 1928, 1930-1934); Soybean seed used per acre (yearbooks for 1922-1923); Soybean seed, average wholesale selling price (yearbooks 1925-1935); Soybean oil crude, selling price per pound (yearbooks 1928-1935); International trade in soybeans and oil (yearbooks 1928-1935); Production of soybean oil (yearbooks 1930-1935).

The titles of tables giving the same type of information vary from year to year, and there are also differences in the time range for statistical tables giving the same type of information.

466. U. S. Department of agriculture, Bureau of agricultural economics. Flax, soybeans, peanuts and cottonseed outlook charts. 3 nos. Washington, D. C., 1935-37. 1.9 Ec70f1

1936 outlook (Washington, D. C., Nov. 1935) contains charts showing Soybeans: acreage, 1929; Soybeans: tonnage gathered and crushed and percentage gathered crushed; Meals, cottonseed, linseed, and soybean: prices per ton at selected markets; Vegetable oils: prices f.o.b. crude, Aug. 1929 to date [includes soybean oil].

1937 outlook (Washington, D. C. November 1936) includes charts showing Soybeans: tonnage gathered and crushed and percentage gathered crushed 1925-26 to date; Vegetable oils: prices f.o.b. crude, Aug. 1929 to date [including soybeans]; Meals, cottonseed, linseed, and soybean: prices per ton at selected markets. Supplement, p. 19, has map showing soybean production in the United States in 1929.



Oil seeds, 1938. Flax, soybeans, peanuts, and cottonseed. 18pp. (Washington, D. C., October 1937) Has charts showing consumption of oils by the drying industries in the United States, 1931 to date [including soybean oil]; Soybeans: Production, utilization, and average farm price, 1924 to date; Factory consumption of soybean oil by groups of industries, United States, 1931 to date; Prices of soybean, cottonseed, and linseed oils in specified localities, 1929 to date; Prices of soybean, cottonseed, and linseed meals at specified markets, 1925 to date.

467. U. S. Department of agriculture, Bureau of agricultural economics. Rice, peanuts, soybeans, dry beans, and broomcorn outlook charts, for use with the Agricultural outlook for 1935. 21pp., processed. Washington, D. C., November 1934. 1.9 Ec70rp  
Map, p. 11, shows soybean acreage for 1929, and a graph, p. 12, shows prices for crude vegetable oils, including imported soybean oil, Oct. 1922 to date.
468. U. S. Department of agriculture, Bureau of agricultural economics. Rice, peanuts, soybeans, dry beans, and broomcorn outlook charts, with explanations, 1933-34. 24pp., processed. Washington, D. C., October 1933. 1.9 Ec70rp  
Map, p. 13, shows soybean acreage, 1929; and a graph, p. 14, shows prices for crude vegetable oils, including imported soybean oil, Oct. 1922 to date.
469. U. S. Department of agriculture, Bureau of agricultural economics. Soybean, cowpea, and velvet bean shipments, stocks, and prices. 2pp., processed. [Washington, D. C., March 16, 1938.] 1.9 Ec712Sc  
Includes a table showing Comparative Stocks, Shipments, and Prices, Compiled from seed shippers' reports, for soybeans, cowpeas and velvet beans, by state or district.
470. U. S. Department of agriculture, Bureau of agricultural economics, Hay, feed and seed division. Soybeans crushed, oil and meal produced, imports and exports soybeans and soybean products, and stocks of soybeans and soybean oil (compiled from Department of commerce statistics of fats and oils, except as noted). 1p., processed. [Washington, D. C., April 27, 1937.] (HFS-1863) 1.9 Ec712Soy  
April 27, 1937 gives figures in tons, 1928-1935, by years, beginning October 1st, and stocks of soybean oil and soybeans, by years beginning Sept. 30, 1929-1936.
471. U. S. Department of agriculture, Bureau of agricultural economics, Hay, feed and seed division. Soybeans crushed, oil and meal produced, imports and exports soybean products, and stocks of soybeans and soybean oil. (compiled from Department of commerce

statistics of fats and oils). 1p., processed. [Washington, D. C., 1935?] 1.9 Ec712Soy

Gives figures in tons, 1926 to 1934, by years, for year ending September 30, and stocks of soybean oil and soybeans, by years beginning Sept. 30, 1926 to 1934.

472. U. S. Department of agriculture, Bureau of crop estimates. Cowpea, soy bean, and velvet bean production, 1918 and 1917 as estimated by state field agents... 1p. [Washington, D. C., U. S. Dept. of agriculture, Bureau of crop estimates, May 25, 1919] 1.9 St2Cp

Lists soybeans produced for grain by states, giving acres, yield per acre in bushels and total production in bushels, for 1917 and 1918.

473. U. S. Department of agriculture, Bureau of markets. Seed reporter, v. 1, no. 1-v. 3, no. 4. Washington, D. C., November 1917-Oct. 11, 1919. 1 M348

Discontinued after Oct. 11, 1919.

Seed reports continued in the U. S. Dept. of Agriculture, Bureau of Markets, Market Reporter.

The following data on soybeans are included:

Soy bean situation in eastern North Carolina, 1(1): 4. November 1917; Soy beans in Mississippi and Louisiana 1(2): 8. Dec. 1, 1917; Tabulation of reports from shippers of cowpeas, soy beans, and lespedeza 1(4): 2. Feb. 1, 1918; Movement and supplies of soy beans and cowpeas 1(7): 1. April 6, 1918; Tabulation of reports from shippers of sorghums, millets, sudan grass, soy beans, cowpeas, and lespedeza. 1(7): 3. April 6, 1918; Movement of forage crop seeds from first hands: soy beans. 2(1): 7. July 6, 1918; Report of commercial field seed stocks, sales and seed requirements for the United States; seed survey of July 1, 1918. Soy beans. 2(4): 3. Oct. 5, 1918; Soy bean, cowpea, and velvet bean seed outlook. 2(7): 3-4. Jan. 11, 1919; Notice of special Soy bean, cowpea, and velvet bean inquiry. 2(7): 4. Jan. 11, 1919; Seed market notes: soy beans, cowpeas, and millets 2(7): 4. Jan. 11, 1919. (Gives prices); Stocks, shipments, prices, etc., of soy beans and cowpeas 2(8): 6. Feb. 8, 1919; Final soy bean, cowpea, and velvet bean, and millet and sorghum seed shippers' report. 2(9): 6. March 8, 1919; Movement and supplies of soy beans, cowpeas and velvet beans 2(10): 6. April 5, 1919; Soy bean and cowpea variety information 2(10): 7. April 5, 1919. (Average percentage of total quantity normally handled by wholesale and retail seedsmen, and average percentage of total quantity normally shipped out from producing centers by local shippers.); Soy beans: counties reported as normally producing either a surplus quantity or an insufficient quantity of seed as compared with planting requirements. 2(12): 6. June 7, 1919. (A map); and Estimated total seed requirements and the estimated percentage and quantity that are obtained from each of the three general sources of supply: soy beans. 3(4): 11. Oct. 11, 1919.



474. U. S. Department of agriculture, Bureau of markets and crop estimates. The market reporter, v. 1-4, Jan. 3, 1920-Dec. 31, 1921. 4v. [Washington, Govt. print. off.] 1920-21. 1 M34M

v. 1-3, 1920-June, 1921, issued by Bureau of markets.

"The Market reporter is an outgrowth of earlier publications in more limited fields issued by the Bureau of markets. The periodicals formerly issued under the titles of 'Seed reporter' and 'Food surveys' have been merged into this more comprehensive publication..." - v. 1, no. 1, p. 1.

In January, 1922, combined with Monthly Crop Reporter and the National Weather and Crop Bulletin to form Weather, Crops and Markets.

The following soybean statistics are included:

Acreage, yield and prices of soybeans, v. 2, no. 20, p. 317, Nov. 13, 1920; and v. 4, no. 22, p. 351. Nov. 26, 1921; Stocks, shipments and prices of soybeans, cowpeas and velvet beans for seed (by states, based on seed shippers' reports), v. 1, no. 7, p. 103. Feb. 14, 1920; Retail seed prices (including soybeans) monthly, v. 1, March 6-June 5, 1920, and v. 3, March 12-June 4, 1921; Wholesale prices of field seeds (including soybeans) weekly, v. 1, Jan. 3-June 5, 1920, and v. 3, Jan. 8-June 4, 1921; Stocks of vegetable oils (including soybean oil) at end of quarter year periods (1919 and 1920), yearly production and consumption (1912-18), and imports of oils and lards (1912-20), in v. 2, no. 23, p. 366. Dec. 4, 1920.

For brief articles and notices on soybeans, consult index under Beans, soy.

475. U. S. Department of commerce, Bureau of the census. United States census of agriculture: 1935, v. 1-3. Washington, U. S. Govt. print. off., 1936. 157.41 C3322

V. 2. Reports for States with Statistics for Counties and a Summary for the United States, second series, includes, table XII, p. XXIII, statistics on soybeans harvested for beans or hay, or grazed, acreage grown alone, acreage grown with other crops, acreage and bushels harvested for beans, and value in dollars for the United States, 1909, 1919, 1929, and 1934. Table XV, pp. XXXIV-XXXV, summarizes soybean statistics of soybeans grown alone, grown with other crops and harvested for beans, by divisions and states, 1934 and 1929, and the same statistics are given by counties for each state (Title: Miscellaneous crops - annual legumes...Jan. 1, 1935); also gives for each state: acreage, quantity and value of miscellaneous crops harvested, 1909 to 1934 (including soybean total acreage, acres grown alone and with other crops, quantity harvested for beans, and value of beans harvested, 1934, 1929, 1924, 1919, and 1909).

V. 3. General Report. Statistics by Subjects, has a table, no. 26, pp. 340-341: Soybeans harvested for beans or hay, or grazed -

farms reporting and acreage, with quantity and value of beans harvested, by divisions and states: 1934 and 1929. Soybean figures are also included in table 1, p. 295: Farms reporting, acreage harvested, production, and value of crops in the United States: 1934 and 1929; and in table 2, p. 299, Specified crops - summary for the United States: 1839 to 1934 [soybeans harvested for beans, in 1909, 1919, 1929, and 1934.]; and in table 66, p. 396, Rank of divisions and states in the acreage, production, and value of specified crops, 1934 and 1929...[soybeans harvested for all purposes and beans harvested.]

For earlier figures see The Fifteenth Census of the United States: 1930. Agriculture, Volume IV, General Report, Statistics by Subjects. Washington, U. S. Govt. print. off., 1932. 157.4 C153. Includes, Ch. XI, statistics on individual crops. Table 41, p. 770, gives statistics of soybeans, acreage grown alone and with other crops, bushels and value harvested, 1929, by divisions and states; and a map, p. 769, shows soybean acreage grown alone and with other crops in 1929. V. II, 3 pts, gives reports by states, with statistics for counties and a summary for the United States. Table 41, pt. 1, p. 84, shows farms reporting soybeans, acreage grown alone and with other crops, and quantity harvested for geographic divisions and states; county tables VII include for counties in each state, farms reporting soybeans, acreage grown, alone and with other crops, and bushels for 1929.

The United States Census of Agriculture, 1925, 3pts. Washington, U. S. Govt. print. off., 1927. 157.41 C332

Pt. 1. has Summary for the United States, pp. 1-77. State table VI, pp. 60-67, includes number of farms reporting soybeans for the United States and divisions, 1924. County tables are given for each state for the same information.

The Fourteenth Census of the United States taken in the year 1920. Volume V. Agriculture. General Report and Analytical Tables. Washington, Govt. print. off., 1922. 157.4 C14. Table 58, p. 777, includes figures on soybeans, farms reporting, acreage, production in bushels, and value, 1919 and 1909, by states. Ch. XI. Summary for all crops, has a table, no. 1, p. 700, which shows acreage, production, and value of all crops in the United States: 1919 and 1909, including soybeans. Table 9, States leading in the production of each crop: 1919, includes soybeans.

The Thirteenth Census of the United States taken in the year 1910. Volume V. Agriculture, 1909 and 1910. General report and analysis. Washington, Govt. print. off., 1914. 157.4 C13 Ch. IX. Individual crops, has a table, no. 53, p. 626, for dry beans other than edible, which includes figures on acreage, production in bushels, and value of soybeans, in 1909, for six states.

476. U. S. Tariff commission. Certain vegetable oils. 174pp. Washington, Govt. print. off., 1926. 173 T17Ce



Part 1. Costs of production, contains a statement, Section 4, pp. 55-74, on soybean oil. It gives the rates of duty, and describes the uses for the oil, its sources, foreign and domestic production, domestic production and consumption, imports, principal competing country (Manchuria), exports of domestic and foreign oil, foreign production and consumption, costs of production in the United States, China, Japan, and Great Britain, and a comparison of these cost data. Section 5, Interest on Capital Invested in Crushing Vegetable Oils, has a passage on soybean oil, p. 77, which gives that information for 1924.

Part 2. Economic Study of the Trade in and Prices and Interchangeability of Oils and Fats, includes references to the domestic production of soybean oil, pp. 94-95; net imports of oils, including soybean oil, into the United States 1910-1924, pp. 97-98; general imports of the principal free vegetable oils, 1912, 1914, and 1916-1924, p. 101; international supply and consumption of soybeans and soybean oil, pp. 115-117; price changes of soybean oil and beans, p. 139; statistics of these price changes, pp. 142, 143, 152, 153, 154, 155. The Interchangeability of Oils and Fats in Consuming Industries, pp. 156-174, has scattered references to soybean oil, and a special section on soybean oil, pp. 172-174, giving data received from questionnaires on the interchangeability of oils and fats.

477. U. S. Tariff commission. Survey of the American soya-bean oil industry. Prepared by the United States Tariff commission and printed for the use of Committee on ways and means, House of representatives. 22pp. Washington, Govt. print. off., 1920. 173 T17Ss

The study gives a description of the oil, its uses, methods of production, domestic production and consumption, domestic exports, foreign production and international trade, imports, prices, competitive conditions, and tariff history.

Tables include domestic production, imports for consumption, domestic exports and value of imports for consumption for the calendar years 1910-1920; soybean oil production in the United States in pounds, 1914, 1916-1919; quantity and value of soybean oil imports by countries 1912-1920; revenue on soybean oil and cake imports for consumption; quantity and value of domestic exports of soybean oil for 6 months ending Dec. 31, 1919; prices of wholesale soybean oil at Dairen, Manchuria; prices of Manchurian soybean oil in New York, 1913-1919; prices of soybean cake in Dairen, 1918-1919; rates of duty on soybean oil, 1883-1913; consumption of fats and oils, including soybean oil) by the lard-substitute industry, 1912, 1914, 1916-1918; consumption of fats and oils by the soap industry (including soybean oil), 1912, 1914, 1916, 1917; consumption of fats and oils by the oleo-margarine industry (including soybean oil), 1912, 1914, 1916-1918.

This same title is included, pp. 197-212, in U. S. Tariff commission. Tariff information surveys on the articles in paragraphs

44 and 45 of the Tariff act of 1913, and related articles in other paragraphs. 212pp., rev. ed. Washington, Govt. print. off., 1921. (A-11) 173 T17Ta A-11 1913.

478. Wright, Philip G. The tariff on animal and vegetable oils. 347pp. New York, The Macmillan co., 1928. (Institute of Economics. Investigations in International Commercial Policies) 285 W93T  
"With the Aid of the Council and Staff of the Institute of Economics."

Soya Bean Oil, pp. 50-52, brings out the properties and uses of the oil, methods of production, and amount of production, imports, and exports for the years 1914-1926. Conclusions as to the tariff policy on the oil are made, pp. 232-236; figures as to the rise in prices from June, 1921, to December, 1923, and to December, 1925, p. 132.

The appendix contains numerous statistical tables which include information on soybean oil: I. Domestic production of the principal oils and fats, 1914 and 1919-1926; II. Imports of the principal animal and vegetable oils and fats for the years specified [1914-1926]; III. Exports of the principal animal and vegetable oils and fats, 1914 and 1919-1926; IV. Domestic consumption of the principal animal and vegetable oils and fats, 1914 and 1919-1926; V. Data indicating the extent to which the United States is self-sufficient in the production of the fatty oils; VI. Domestic production and foreign trade of the United States in raw materials of the vegetable oils, 1914 and 1919-1926; VII. Revenues derived from imports of the principal animal and vegetable oils and fats, 1914 and 1919-1926; IX. Prices of the principal oils and fats, by months, January, 1920, to September, 1927, inclusive.

#### STORAGE

479. Bredemann, G., and Kummer, H. Ueber den einfluss der lagerung der sojabohnen auf die extrahierbarkeit und die extraktionsgeschwindigkeit des oeles und der phosphatide. Fettchemische Umschau 41(5): 81-85. May 1934. 384 C422

Influence of storage of soybeans on the yield and speed of extraction of oil and phosphatides.

480. Fire in soybean meal bin. Grain & Feed Jours. Consolidated 78(6): 259. Mar. 24, 1937. 298.8 G762

A description of the fire in the soybean oil mill of Spencer Kellogg & Son at Des Moines, Ia., and the conditions causing it.

481. Halliday, George E. Changes in the phosphatide content of crude soybean oil during storage. Oil & Soap 14(4): 103-104. April 1937. 307.8 J82

"A paper presented at the Fall meeting of the American Oil Chemists' Society, at Chicago, October 8-9, 1936."



Bibliography, p. 104.

"These data are from a thesis submitted by G. E. Halliday to the Faculty of the Graduate School of Purdue University in partial fulfillment of the requirements for the degree of Master of Science, August, 1934."

Results of sampling at three levels, for phosphorus content, fifteen carloads of crude soybean oil which had been stored from three to 112 days.

482. Jones, D. Breese, and Gersdorff, Charles E. F. Changes that occur in the proteins of soybean meal as a result of storage. Amer. Chem. Soc. Jour. 60(3): 723-724. March 1938. 381 Am33J

"The chemical studies outlined above are being supplemented by feeding experiments to determine the effects of storage on the biological value of the proteins. Storage studies on the samples will be continued for two years or more. Final results and details of the work will be published later. Similar studies on the proteins of other seeds of importance as foodstuffs will be made both on the meals and on the whole grains."

These studies are being carried out by the Protein and Nutrition Research Division, Bureau of Chemistry and Soils, U. S. Department of Agriculture.

483. McClain, R. E. Soybean hazard. Hot meal cakes transferred to storage tanks cause fire. Weekly Underwriter 137(6): 255-256. August 7, 1937. Libr. Cong. HG8011.W4

Describes the fire which occurred in the steel tank filled with soybean meal cake at the oil extraction plant of Spencer Kellogg and Sons, Inc., Des Moines, Iowa, and the best method of preventing and controlling such fires in the future.

484. A Manchurian railroad sets a wise example for American railroads. Manfrs. Rec. 88(22): 56-57. Nov. 26, 1925. 297.8 M31

"This article is based on one by Taro Ito entitled "The Soya Bean in Manchuria" in the Far Eastern Review. It describes the "mixed storage system" of the South Manchuria Railway Co., which has resulted in improvement of quality and facilitated the sale of beans.

485. Moscow. Nauchno-issledovatel'skii institut soi i spetsial'nykh kul'tur. ...Sushka i khranenie semian soi. Sbornik statei. 157pp. [Moskva] 1932. 60.3 M35

At head of title: - Vsesoiuznyi nauchno-issledovatel'skii institut soi. M. S. Duhin, V. N. Galich...

This is a series of studies on drying and storing soybean seeds written in Russian with English summaries.

Results of practical work and actual problems of drying and storing soybean-seeds, by M. S. Dounine and N. S. Thormann, pp. 171-58 (Summary in English, pp. 57-58).

Heat and moisture régime for the storage of soybean seeds, by M. S. Dounine and E. A. Tolskaya, pp. [59]-[103]. Summary, pp. [100]-102.

Chemical (granular) method of drying soybean seeds, by M. S. Dounine, pp. [105]-[137]. Summary, pp. 135-[137].

Claytonisation of soybean seeds, by M. S. Dounine, A. M. Synski, and F. M. Shemiakin, pp. [139]-[151]. Summary, pp. 150-[151]. This gives results of treating soybean seeds with SO<sub>2</sub> to stop fungus and bacterial infection.

486. Oathout, C. H. Vitality of soybean seed as affected by storage conditions and mechanical injury. Amer. Soc. Agron. Jour. 20(8): 837-855. August 1928. 4 Am34P

"Literature cited", pp. 854-855.

"Contribution from Dept. of Agronomy, University of Illinois, Urbana, Ill..." - Note.

"The experiments presented in this paper fall under two headings, viz., storage conditions affecting the longevity of soybean seed and the effect of threshing injury upon the longevity and vigor of soybean seed."

487. A soybean elevator. Grain & Feed Jours. Consolidated 77(12): 511-512. Dec. 23, 1936. 298.8 G762

A description of the soybean elevator completed for Spencer Kellogg & Sons, Inc., Chicago, Ill.

488. The soybean in American feed milling. Amer. Miller 57(2): 1197. Dec. 1, 1929. 298.8 Am32

This article describes the plant at Peoria, Ill., of the American Milling Co. (Allied Mills), which is constructing a new elevator in which to store soybeans, one of their principal commodities.

489. Storing soybeans for seed. Grain & Feed Jours. Consolidated 75(8): 336. Oct. 23, 1935. 298.8 G762

"In January and February, 1933, soybean seed from the 1932 crop of five varieties commonly grown in Illinois, and eight varieties commonly grown in North Carolina, were placed in storage by the Division of Seed Investigations at Urbana, Illinois; Montgomery, Ala.; Washington, D. C., and in the tidewater region of North Carolina..."

"Present indications are that in addition to the moisture content and temperature, other factors, such as the oil content, contribute toward the ability of soybean seed to retain its viability."

490. Wand, Frederick A. Safe storing of soybeans. Grain & Feed Jours. Consolidated 74(7): 283. Apr. 10, 1935. 298.8 G762

Abstract of address "before Society of Grain Elevator Superintendents."

Soybean market grades, and rules to be followed in storing the beans, are considered.



UTILIZATION

General

491. Adkins, Dorothy Margaret. The soya-bean problem. Science Prog. [London] 15(59): 445-451. January 1921. 472 Sci22  
The author sets forth the uses for the bean, the oil, cake and meal, and the food value of the bean. Its importance in the United States is briefly mentioned.
492. An agricultural crop of tremendous possibilities for industry. Manfrs. Rec. 105(4): 30. April 1936. 297.8 M31  
"Production of soy beans rapidly increasing because of their industrial and food value. May be processed by South's cottonseed and peanut crushing plants." The work of the industrial research laboratory at Urbana, Illinois, is mentioned.
493. [American chemical society.] The utilization of soya beans. A series of papers read before the American chemical society. Chem. Age [London] 34(880): 417-418. May 9, 1936. 382 C427  
Abstracts of seven papers on soybeans read before a "recent" meeting of the Division of Agricultural and Food Chemistry of the American Chemical Society, at Kansas City. The papers were 1) [Chemical studies of the beans and their utilization] by N. F. Tree; 2) [Soybean oil in the paint industry] by E. E. Ware; 3) [Extraction methods] by N. T. Spoerri; 4) [Uses of soy oil] by M. M. Durkee; 5) [Food uses for varieties of beans] by Sybil Woodruff and Helen Klaas; 6) [Improvement of nutritive properties of soybeans brought about by heating] by C. L. Shrewsbury and E. B. Johnson; 7) [Soybean oil for soap making] by A. A. Horvath.
494. American farm bureau federation. Interchangeability of oils and fats. Report. 71st Congress, 2d sess., Senate doc. 82, 115pp. Washington, U. S. Govt. print. off., 1930. Pam. Coll. (Fats and Oils)  
Quotations are assembled, pp. 41-43, on the uses of soybean oil as food, in soap making, for paints and varnishes, and in rubber substitutes, and its possible substitution or interchangeability for edible purposes, for soap making, and for paints, varnishes and oilcloth. The section on soybean oil in the condensed summary of oils and fats mentioned in the tariff bill (H.R. 2667) is given on p. 102.
495. Anderson, Russell H. The industrial uses of the soybean. 10pp., processed. Chicago, Museum of science and industry, 1936. Pam. Coll.  
This talk was a broadcast over the Affiliated Broadcasting Co., May 9, 1936.  
The utilization of soybean oil in the paint industry and of the meal in plastics, and food products produced from the soybean are

described. It is said that "few if any strictly new products utilizing the soybean have been developed", since the use of the bean usually means the displacement of some other product.

496. Barr, J. E. Soybean industry is rapidly developing in United States. U. S. Dept. Agr. Yearbook, 1930: 487-488. Washington, D. C., 1930. 1 Ag84Y

The industrial value of soybean oil and meal, soybeans for human food, and the need for crushers of a constant supply of beans, are pointed out.

497. Barr, J. E. Soybeans: the basis of a new industry. 2pp., processed. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Hay, feed and seed division, 1929. 1.9 Ec7Ra  
"Radio talk...delivered through Station WRC and 16 other stations associated with the National Broadcasting Company, June 7, 1929."

Uses for soybean oil and soybean meal, and the financial aspects of soybeans for the farmer are described.

498. Beltzer, Francis J. G. Etudes sur la caséine végétale du "soja" et ses applications. Revue Scientifique 49, 1<sup>er</sup> sem. (23): 716-720. June 10, 1911. 473 R32

This is a study of the vegetable casein obtained from the soybean and its applications. The preparation of vegetable milk and cheese, and the preparation and extraction of the casein in industry and the uses to which it may be put, are described.

Extended utilization of soya bean products. Sci. Amer. Suppl. 72(1859): 115. Aug. 19, 1911. 470 Sci25. This is an article on the food and industrial uses of the soybean, based on the article by F. J. G. Beltzer in the Revue Scientifique.

499. Beltzer, Francis, J. G. Industries du lactose et de la caséine végétale du "soja". 144pp. Paris, B. Tignol [1912] (Bibliothèque des actualités industrielles, no. 144) 309 B41

Part II. Le Lait Végétal, La Caséine Végétale, et les produits industriels retirés des graines de "soja", pp. 101-141. The following matters are taken up: vegetable milk prepared from soybeans, vegetable cheese, industrial vegetable casein and details of its preparation, the equipment and management of a factory for the treatment of soybeans, and the uses in industry for the casein.

500. Beltzer, Francis J. G. Le lait végétal, la caséine végétale et les produits industriels retirés des graines de "soja". Revue de Chimie Industrielle 22(259): 209-215; (260): 241-251. July, August 1911. 383 R326

The writer describes vegetable milk, casein, and the industrial products derived from the soybean.



501. Bolton, E. Richards. Oils, fats and fatty foods; their practical examination; a handbook for the use of analytical and technical chemists and manufacturers; with a chapter on vitamins, by J. C. Drummond; Being a second edition of "Fatty foods" by E. Richards Bolton and Cecil Revis. 416pp. Philadelphia, P. Blakiston's son & co., 1928. 389 B63 Ed.2  
Ch. VIII. Vegetable Oils and Fats, pp. 144-301, contains a section on Soya Oil, pp. 204-207. In it are a brief discussion of the place of soybean oil and meal and beans on the European market, and a description of the oil, its possible adulterants, a proposed standard for valuation of the oil, uses of the oil, and uses of the bean and non-fatty portion.
502. Bordas, Jean. Le soja et son rôle alimentaire. 36pp. Paris, Hermann & cie., 1937. (Actualités Scientifiques et Industrielles 557. Nutrition: Exposés publiés sous la direction de Émile F. Terroine... III.) 60.3 B644  
Bibliography, pp. 35-36.  
Chapter III, pp. 17-24, gives an analysis of the food value of the soybean and its use as forage.  
Chapter IV, pp. 25-29, outlines the agricultural and industrial uses for the bean and its utilization in various food preparations.
503. Borkowski, Rudolf. Die entwicklung der production und des internationalen handels an hülsefrüchten. 133pp. Berlin-Neukölln. 1933. 60.3 B642  
Inaug.-diss.-Landw. hochschule, Berlin.  
Bibliography, pp. 131-133.  
An account of the use of legumes...for human and animal food followed by a discussion of production and export of legumes in the most important countries. - Agr. Econ. Lit. 7(7): 505. September 1933.  
Soybeans are included.
504. Bowdidge, Elizabeth. The soya bean; its history, cultivation (in England) and uses; foreword by Sir John T. Davies. 83pp. London, Humphrey Milford, Oxford Univ. press, 1935. 60.3 B67  
The place of the soybean in the United States, pp. 10-11; feeding value and cutting of soybean hay, pp. 53-56; value of soybean straw, pp. 56, 58; soybeans in soil improvement, pp. 61-63; uses for soybean oil, cake and meal, pp. 64-78; soybeans as human food, pp. 79-83.
505. Breedlove, L. B. Food and industrial prospects for soybeans. Grain & Feed Jours. Consolidated 77(8): 363. Oct. 28, 1936. 298.8 G762  
"Excerpts from the address...before the Soybean Conference at the Grain & Feed Dealers National Ass'n convention."  
Food and industrial uses of the beans are described.

506. Burlison, W. L. The soybean. A plant immigrant makes good. Indus. and Engin. Chem. 28(7): 772-777. July 1936. 381 J825

"Literature cited", p. 777.

"The soybean, established for many centuries in the Orient, is now rapidly coming into prominence as a farm crop in this country. Nearly 40,000,000 bushels of soybeans were grown in the United States in 1935. The soybean grain is by far the richest in protein and oil of any of our common crops. Besides furnishing excellent feed and fodder on the farm, the soybean is finding a wide use in the industries. Various edible products of high nutritive value are becoming available on the market. Besides its use in the paint industry, the oil has a prominent place in the fabrication of a long list of important commercial commodities. The residue from the oil is now receiving much attention as a raw material for the preparation of plastics and paper sizing." - Abstract, p. 773,

Lines of study needing investigation are listed at the close of the article.

Printed "in substantially the same form" as Ill. Agr. Col. Ext. Circ. 461, 15pp, Urbana, 1936.

507. Carminati, Giulio. La soia e la lana artificiale. L'Italia Vinicola ed Agraria 26(4): 50-53. Feb. 10, 1936. 95.8 Itl

The writer discusses the artificial wool produced from soybeans, and other uses to which the beans are put. The possibilities of the crop for Italy are considered.

508. Cruz, Aurelio O., and West, Augustus P. Composition of Philippine soy beans and soy-bean oil. Philippine Jour. Sci. 48(1): 77-88. May 1932. 475 P53

It is shown in the analyses that Philippine soybeans and soy-bean oil are very similar in composition to those produced in other countries. The industrial and food uses and value of the beans are pointed out.

509. Edie, E. S. Cultivation and uses of soya beans. Liverpool Univ. Inst. Com. Research in the Tropics Bull. 1(1): 7, Oct. 8, 1909. 26 L75

Contains a section on uses for the soybean, pp. 1-4.

510. File, Howard. We can make almost anything from soy beans. Farmers' Elevator Guide 31(9): 3-4. Sept. 5, 1936. 280.28 Am3

"An illuminating article published in Staley Journal."

The products of commercial value produced through research by the A. E. Staley Manufacturing Company, are described.



511. Fers, Alberto J. El frijol soya, materia prima para la producción de aceite. Revista de Agricultura 19(8-9): 64-66. August-September 1936. 8 Ag88Re

Briefly describes the importance of the soybean as a raw material for the production of oil. At the end of the article are listed the products (food, feed, and industrial) obtained from the soybean.

512. Fritzsche, Curt. Deutsche sojabohnen. Praktische erfahrungen über anbau und verwertung aus 12 jähriger versuchszeit. 38pp. Frankfurt, Trowitzsch & sohn [1937]. 60.3 F91

The importance of the soybean as food, feed and for oil, pp. 6-9; the advantages of soybean culture for the planter and in the national economy, pp. 32-34; the soybean in national nutrition, pp. 34-35. Recipes are included.

513. Gouin, R. Le soja et son tourteau. Journal d'Agriculture Pratique (n.s.) 56(50): 470-471; (51): 492-494. Dec. 12-19, 1931. 14 J82

Chemical composition of the soybean, products derived from it, the composition of soybean oilcake, and its use in animal feeding are discussed.

514. Hamilton, R. W. Soybeans. Clemson Agr. Col., S. C. Ext. Bull. 76, 16pp. Clemson College, 1926, revised April 1931.

"The varied uses to which soybeans may be put makes this crop adaptable to any farming or cropping system followed in South Carolina. They can be used as a soil improving crop, as a grazing crop, as a hay crop, a supplementary cash crop, or as a combination of these. The impartiality of soybeans to soil type further widens their use to all sections of the state...Soybeans are of more universal utility than any other legume crops grown in South Carolina." - Foreword.

515. Hanger, Wallace E. Uses of soybean seed. Ohio Agr. Col. Ext. Serv. Crop Talk no. 4, [4]pp. Columbus, 1923.

The writer discusses soybeans as a feed, as a source of high-grade oil, soybean oil meal and the outlook for soybean oil mills, and soybeans for seed purposes.

516. Hausman, Margaret J. Soybean oil. Soap 12(12): 27-30, 39, 77. December 1936. 307.8 Sol2

The uses for soybeans, characteristics of the oil and its uses, and the bearing of increasing production of soybean oil on the soapmaker's raw material situation, are described.

517. Hayward, J. W. Utilization of soybeans. Grain & Feed Rev. 26(1): 12, 13, 14-17. September 1936. 280.28 C78 Reprint in Pam. Coll. (Soybeans)

"This paper was prepared...for delivery on Tuesday, June 23, before the Fifty-Seventh Annual Convention of the Ohio Grain, Mill and Feed Dealers Association...Sandusky, Ohio..."

Following a detailed discussion of the chemical composition of the soybean, the paper studies the uses of the bean and its various products such as lecithin, soybean flour, soybean oil, soybean protein, and oil meal; the methods of oil extraction, and the feeding value of the beans; and makes recommendations for the use of soybean oil meal in feeds for poultry and live-stock.

Extract from this paper appeared under title "Using Soybean Oilmeal in Feeds for Poultry and Live Stock." Grain & Feed Jours. Consolidated 77(3): 127. Aug. 12, 1936. 298.8 G762

518. Heinze, B. Einiges über die oelbohne, ihren anbau, den volkswirtschaftlichen wert und ihre besondere bedeutung als heil- und gewürzpflanze. Heil- und Gewürzpflanzen 2(4): 82-91; (6): 129-134. October, December 1918. 71.8 H36

Bibliography, p. 134.

This is a discussion of the economic value of the soybean, its culture, and special uses as a medicinal and aromatic plant.

519. L'Heureux, L. Le soja. Congo 1(2): 214-236; (3): 365-383. February-March 1933. Libr. Cong. DT641.C6

Bibliographie, p. 383.

The first installment enumerates the various food and industrial uses to which the soybean may be put. The second treats of the methods of preparing soybean milk in various countries and the research that has been done in this line.

520. Hills, J. L. Concerning alfalfa and soy beans. Vt. Agr. Expt. Sta. Bull. 204, pp. 40-72. Burlington, 1917.

The section dealing with soybeans, pp. 63-72, includes material on the uses of the soybean as seed and grain, as a soiling crop, as a hay crop, as pasturage, and as silage and grain when mixed with corn.

521. Holland, E. B. Soy beans and soy bean oil. Mass. Agr. Expt. Sta. Ann. Rept., (1908, pt. 2)21: 111-119. Boston, 1909. (Public Doc. No. 31)

The economic uses of the soybean, and the chemistry of soybean oil and meal are brought out.

522. Horvath, A. A. The soy-bean industry in the United States. Jour. Chem. Ed. 10(1): 5-12. January 1933. 381 J826

Bibliography, p. 12.

The writer describes the increasing soybean production in the United States, the processes used in oil milling, the industrial uses of soybean oil and its uses as food, the uses for lecithin, the uses of the beans for various food products, the soybean glue industry, and the Soybean Exhibit at the Chicago World's Fair. A chart shows the exploitation of the soybean. Trading rules of the National Soy-bean Oil Manufacturers Association and the New York Produce Exchange in oils are mentioned.



523. Horvath, A. A. The soybean oil of China and its manifold uses. 57pp. Shanghai, Bureau of industrial and commercial information, Ministry of industry, commerce and labor [19?] (Booklet Series No. 13) 280.9 C44 no. 13  
The author takes up the physico-chemical properties of soybean oil, the refining of crude soybean oil, the process of hardening the oil, its uses for food, soap making, the manufacture of waterproof cement, glycerine from soybean oil, rubber substitutes and artificial petroleum from it.
524. Howell, E. V. Soy beans and soy bean oil. Amer. Pharm. Assoc. Jour. 7(2): 159-163. February 1918. 396.9 Am33J  
Bibliography, pp. 162-163.  
The writer outlines the history of the bean and its importance and uses as food. He states that "while the chief use, so far, of the oil has been for soap and paints, the particular object of this paper has been to call attention to the use of soy oil in pharmaceutical preparations."
525. Jenkins, E. H., Street, John Phillips, and Hubbell, C. D. Tests of soy beans in 1916. Conn. Agr. Expt. Sta. Bull. 193, 12pp. New Haven, 1917.  
"The purpose of this bulletin is to record the results of the Station's tests at Mount Carmel in 1916 and certain other data which concern the soy bean crop.  
"There are four products derived from this crop, one or more of which give it importance in different sections of the country. These are the oil, the oil cake or meal, the seed, and the forage, which is used either for hay, ensilage, soiling, cattle, or as a green manure." - p. 3.
526. Johnson, E. F. Is the soybean over-exploited? Grain and Feed Rev. 26(5): 14-18. January 1937. 280.28 C78  
Address delivered before the Agricultural Club at Chicago, Nov. 12, 1936.  
The food and industrial uses and possibilities of the soybean are emphasized. The writer feels, however, that "to heap on to the soybean additional praise or credit to which it is not entitled, may prove as bad as to encourage the youngster in his thought that he can whip Popeye."  
This address is abstracted under the title "New uses for soybeans" in Grain & Feed Jours. Consolidated 77(11): 483. Dec. 9, 1936. 298.8 G762
527. Jones, D. Breese. Soybeans - their food value. 6pp., processed. Washington, D. C., U. S. Dept. Agr., Bur. Chem. and Soils, 1938. (MC-28) 1.9 C49Mc no. 28  
This report gives the chemical composition of soybeans, the

uses for the oil, the vitamins and proteins in soybeans, the composition of soybean flour and soybean milk, and soybeans as a feed for livestock.

528. Jordan, Sam. Soy beans from soup to nuts. A new crop with many uses both on farms and in factories. Country Gent. 83(39): 7, 34. Sept. 28, 1918. 6 C833

"So here we have a small glimpse of what their future really is. A crop with a great industrial importance, a crop with known forage and manurial possibilities, and a crop holding forth a beneficent promise as an essential food, soy beans will soon be giving corn and wheat a close race for the more prominent places on our agricultural map."

529. Lohse, H. W. The soya bean as a food product and industrial raw material. Canad. Chem. and Metall. 20(7): 224-225. July 1936. 381 C16

"Paper presented at Canadian Chemical Convention, Niagara Falls, June, 1936."

The writer discusses the chemical characteristics of the soybean, its food uses as milk and flour (the milk being manufactured in Canada by Milquo Limited), and the uses for soybean oil and the extracted meal.

530. Lovell, John H. Soy bean as a honey plant. Gleanings Bee Cult. 57(10): 646-648. October 1929. 424.8 G47

The food and industrial uses of the soybean are mentioned. It is concluded that "without more reliable evidence than is at present available, the writer does not think that soybean should be ranked as a honey plant."

531. Lynch, R. Irwin. The soy bean. Gard. Chron. (London) 63(1622): 38. Jan. 26, 1918. 80 G162

The various food and industrial products made from soybeans are briefly mentioned.

532. Megee, C. R. Soybean production in Michigan. Mich. Agr. Expt. Sta. Circ. Bull. 161, 14pp. East Lansing, 1937.

"The adaptation of soybeans in Michigan is limited to those sections and soils upon which corn can be grown for grain purposes. The soybean is a legume high in protein, and the seeds are high in oil. There are many uses that may be made of soybeans and soybean products. These uses may be placed in three general groups as: uses on the farm, uses in industry and manufacturing, and for human consumption." - p. 3.

533. Morris, Curtis. Soy bean greatest natural food. Regional chamber urges East Texas farmers to plant legume because of its many uses. East Texas Chamber Con. East Texas 10(2): 15, 32. November 1935. 6 Ea73

Industrial and food uses of the bean and its oil are brought out.



534. Morse, William Joseph. Soybean utilization. U. S. Dept. Agr. Farmers' Bull. 1617, 28pp. Washington, D. C. Issued January, 1930; revised March 1932. 1 Ag84F

Contents: Introduction, pp. 1-2; Soybeans for human food, pp. 2-6; Soybeans for livestock, pp. 6-9; Soybeans for oil, pp. 9-12; Soybean meal, pp. 12-16; Soybeans for hay, pp. 16-19; Soybeans for pasturage, pp. 20-21; Soybeans for silage, pp. 22-23; Soybeans for soilage, p. 23; Soybeans for soil improvement, pp. 24-26; Soybean straw, pp. 26-27.

A Spanish translation of this appears under the title "La utilización de la soja en diversas industrias" in La Hacienda 25(7): 298-301; (8): 347-349; (9): 394-396. July-September 1930. 6 H11

A translation by Emma López Seña of the 1930 edition of this study under the title "Utilización de la Soya" is published as [Cuba] Estación Experimental Agronómica Circ. 69, 40pp. Santiago de las Vegas, Habana, 1930. 102 C89 no. 69. It contains in addition, on pp. 37-40, a supplement on the cultivation of the crop in Cuba.

535. Morse, William Joseph. Soy beans in the cotton belt. 6pp. Washington [Govt. print. off.] 1915. 1 Ag863Sy

The use of soybeans for hay, for pasture, for soiling, for ensilage, for seed and for human food, storing of the beans, and the value of the oil and cake are pointed out.

Also published as S.R.S. Doc. 43, Ext. Ser. No. A-85. 7pp. 1 Ex89D no. 43

536. Moscow. Nauchno-issledovatel'skii institut soi i spetsial'nykh kul'tur. Soia i nov'ie kul'tur'i. 68pp. Moskva, 193-? (Bulletin no. 3) 60.39 M85

Text in Russian with summaries of some of the articles in English.

Partial contents: - The determination of the quality of soybean seeds, by P. P. Bordakov, pp. 13-17; Complex method of industrial utilization of the soybean, by S. S. Perov, pp. 48-50; New sources of national food supply, by D. E. Belenky, pp. 52-53; Kounyys from soybean milk, by D. E. Belenky and N. N. Popova, pp. 53-54; Bacterial method of obtaining "to-fu", by D. E. Belenky and N. N. Popova, pp. 55-56; The soybeans as a meat substitute in microbiological practice, by D. E. Belenky, pp. 56-57; Utilization and rationalization in the obtaining of "to-fu", by M. Prakhin, pp. 58-60; Soybean oil-cake in poultry raising, by A. A. Prevo, pp. 61-64.

537. Nemzek, L. P. Economic possibilities of the soyabean. Field Illus. 32(5): 284-285, 322. May 1922. 42.8 Sp6

Value of soybean oil, results of paint exposure tests made at Washington, D. C., in connection with the Institute of Industrial

Research, methods of extracting the oil, use of the cake or meal as food, commercial food products made from the beans, and their chemical trade uses, are taken up.

538. Oil, paint and drug reporter. Green book buyers directory, 1937-38, twenty-fifth year. 1004pp. New York, Oil, paint and drug reporter, inc., 1937. 225 O15

See under Soybeans, Soybean cake and meal, Soybean flour, Soybean glue, Soybean oil, Soybean oil acids, Soybean oil, blown, and Soybean oil stearine, in Part I for firms selling those products.

539. Pacific northwest chemurgic conference. Proceedings. 134pp. [Olympia?] Published by Ernest N. Hutchinson, secretary of state, 1937. 281.9 P11

"Pacific Northwest Chemurgic Conference with Washington State Planning Council, Spokane, Washington, March 22-23, 1937."

Soy flour, by E. E. Roquemore, pp. 93-95, outlines the protein, vitamin and mineral content of soybean flour, and its uses in the sausage manufacturing industry and in baking.

Plastics and solvents including casein from the farm, by J. Allen Harris, pp. 104-109, includes a brief passage on soybean plastics.

540. Phillips, J. B. The utilization of the soya bean. Soc. Chem. Indus. Jour. 53(29): 627-628. July 20, 1934. 382 M31

"Lecture delivered before the Montreal Section of the Society on Feb. 21, 1934."

Uses and consumption for various uses in the United States, are included.

541. Products obtained from cotton seed and soy beans. Prog. Farmer 31: 1443. Dec. 16, 1916.  
Not examined.

542. The prolific soya bean. Sci. Amer. 116(20): 492. May 19, 1917. 470 Sci25

The article describes the general uses of the bean, and the use of a solvent in extracting the oil from it.

543. Rouest, L. Le soja et son lait végétal. Applications agricoles et industrielles. 157pp. Lucie-Grazaille, Carcassone, auteur, 1921. 60.3 R75 (Bibliothèque de Technique Agricole Moderne)  
Bibliography, pp. 153-154.

Ch. IV, pp. 72-80, takes up the use of the soybean for forage; Ch. V, pp. 81-91, includes information on yields and chemical composition of the bean and its use in animal feeding; Ch. VI, pp. 92-97, brings out the value of the soy oil and cake and production



of the cake in various countries, 1915-1919; Ch. VII, pp. 98-110, describes the making of soy milk, its composition, powdered soy milk, soy milk in animal feeding, and in this connection its use as a preventive of tuberculosis transmission and as a means of conserving animal milk and butter for human consumption, and the value of soy milk cake; Ch. VIII, pp. 111-116, discusses the use of the soybean in industry; and Ch. IX, pp. 117-128, the many uses of the soybean in human nourishment.

544. Slawson, H. H. Agriculture's Jack of all trades. Introducing the versatile soybean with which you may either build automobiles or run them and in which many people see possibilities for farm relief without benefit of subsidy. Nation's Business 24(9): 24-26, 94. September 1936. 286.8 N212  
Recent research programs on the uses of soybeans, and the new industrial uses for them are brought out.
545. Smith, Isaac A. Soy beans and secrets of legume inoculation. 22pp. Warren, Indiana, I. A. Smith, 1913. 77 Sm5  
Special uses for soybeans and cultural methods are briefly given, pp. 2-6.
546. Smith, Walter G. Soy bean: (a) its uses; (b) the action of its enzyme, urease, upon urea. Dublin Jour. Med. Sci. 141(533, ser. 3): 299-307. May 1, 1916. Army Medical Library  
Includes on pp. 299-300, a brief discussion of the food and industrial uses of the bean.
547. South Manchuria railway co., Bureau of agriculture. Soya beans in Manchuria. 40pp. Dairen, South Manchuria railway co., 1926. 60.3 So82  
Ch. III. Uses of Beans, pp. 10-18, gives uses as food, cattle feed, and fertilizer, and uses for the oil.
548. Soybean show train to tour East. Railway Age 103(8): 246-247. Aug. 21, 1937. 288.8 R136  
A description of the train on the Pennsylvania railroad "housing an exhibition and equipment for the demonstration of the uses and method of production of the soybean" which was to tour New Jersey, Pennsylvania, Ohio, Indiana and Illinois. "The tour is under the sponsorship of the American Soybean Association, in cooperation with the U. S. Department of Agriculture, several state agricultural colleges, the National Soybean Processors Association and the Pennsylvania."
549. Soy bean useful crop. May be utilized in greater number of ways than almost any other agricultural product. U. S. Dept. Agr. Weekly News Letter 4(27): 3. Washington, D. C., Feb. 7, 1917. 1 Ag84W

Various ways of utilizing the bean as human food, as stock feed, as fertilizer and in oil mills, are cited.

Also in Coop. Manager and Farmer 6(8): 40-41. May 1917.  
280.28 C78; in Va. Dept. Agr. and Immigr. Year Book 1917-1918:  
174-176. Richmond, 1918. (Bulletin 126) 2 V81B; and in Jersey  
Bull. 36(9): 323, Feb. 28, 1917. 43.8 J48

See also The soy bean. Jour. Home Econ. 9(4): 183-184.  
April 1917. 321.8 J82; and Soybeans for human food. Ohio Farmer  
139(10, whole no. 3600): 377. March 10, 1917. 6 Oh3

550. Soybeans. Purdue Agr. 17(2): 28. November 1922. 6 P97  
Soybeans as replacement for clover and for pressing for oil  
are discussed.
551. Soy beans; which may be glue, milk, cheese, sauce, varnish, axle grease,  
fertilizer, soap, soup, buttons, artificial leather, enamel.  
Fortune 1(5): 102, 104. June 1930. Libr. Cong. HF5001.F7  
The history of the soybean in various countries and its uses  
in the United States are outlined.
552. Steen, Herman. Many products made from soybeans. Commercial demand  
increasing every year. Prairie Farmer 101(45): 1487, 1502. Nov.  
9, 1929. 6 P883B  
Gives the principal uses of the soybean, including new indus-  
trial uses.
553. Strickler, Paul B. Uses of soybeans in feeding. New methods of utilizing  
an old crop. Wallaces' Farmer 56(14): 469. Apr. 4, 1931. 6 W15  
Uses in industry and as food for the soybean are mentioned,  
and its uses in feeding are discussed.
554. Tonnelier, A. C. La soja hispida y sus aplicaciones. 16pp. Buenos  
Aires, Ministerio de agricultura, Dirección general de enseñanza  
agrícola, 1912. 77 T61  
Includes a description of various soybean products and their  
chemical composition.
555. Trabut. Le soja legume. Academie d'Agriculture de France. Comptes  
Rendus 13(18): 611-613. May 25, June 1, 1927. 14 P215Bc  
Uses to which the soy is put in various countries are outlined  
and its use in France is urged. Value of the bean for human food  
is brought out.
556. Turner, A. Grenville. A wonderful bean. Bounteous nature's gift from  
the East. Manifold uses of the soybean. Milling 69(25): 695-696,  
698. Dec. 17, 1927. 298.8 M622  
How the bean and its oil can be used, the soybean as a seed  
crop, and methods of oil extraction are taken up. Uses for the  
bean and methods of extraction used in the United States are included.



557. El valor alimenticio e industrial del frijol soya. Revista de Agricultura [Cuba] 20(7): 30-36. July 1937. 8 Ag88Re  
According to an editorial note, the data for this publication were taken from a study on the soybean published by the Agricultural Experiment Station of Newark, U. S. A.  
The alimentary and industrial value of the soybean are described in this article. Its three constituents of most value to industry are said to be the oil, phosphates and proteins.
558. Venturi, Romolo. La soia, come materia prima nella fabbricazione di importanti prodotti terapeutici ed industriali. Bollettino Chimico Farmaceutico 65(16): 481-485. Aug. 30, 1926. Army Medical Library  
An analysis of the various plant parts of the soybean and their adaptation to use as food, medicinal, technical and industrial products.
559. Vision and the soy bean. Home Acres Ed. of Garden Digest 7(old ser. v. 23)(5): 10-11. September 1935. 80 G1623.  
Published as Pt. 2 of Garden Digest, Home Acres Edition on alternate months.  
The author describes the research in soybeans at the Edison Institute at Dearborn, Michigan.
560. Waal, A. J. C. de. Over soja-producten. Chemisch Weekblad 14(15): 344-356. April 14, 1917. 385 C42  
Describes the work done by men in different countries on various soybean preparations and includes a paper by Yu Ying Li entitled "Procédés et Dispositifs pour la Transformation Intégrale du Soya" including the food and industrial uses of the soybean.
561. Wheeler, Agnes A. Consider the soy bean. Better Fruit 32(7): 10, 14. January 1938. 80 B46  
The increase in soybean production in the United States, their value as food and the products made from them, their value as feed for sheep and poultry, and the various uses for soybean oil, are among the topics considered.
562. White, Buxton. The soy bean industry of eastern North Carolina. N. C. Agr. Col. Ext. Circ. 9, 8pp. Raleigh, 1916.  
Includes sections on the seed production industry, and on the uses of soybeans for oil, hay, as a pasture crop, as a soiling crop, and for ensilage.
563. Williams, C. B. Soy-bean products and their uses. N. C. Agr. Expt. Sta. Circ. 34, 7pp. Raleigh and West Raleigh, 1916.  
The writer brings out the wider usefulness for soybeans, the beginnings of manufacture of soybean oil and meal from domestic

soybeans in the United States by the Elizabeth City [N. C.] Oil and Fertilizer Co., the uses for soybean oil, the composition and exchange value of the meal, prices paid for beans by the oil mills, soybean meal as a feed, and as human food. A diagram shows the products secured from a ton of soybeans, and the material made from these products.

564. Williams, C. B. Soy-bean products and their uses. Pure Products 15(7): 339-345. July 1919. 389.8 P97

This is a discussion of the increased soybean utilization by mills, uses for the oil extracted and for the meal, prices paid for beans by the oil mills, quantity of oil imported into the United States, the use of soybean meal as a feed, and food products made from it.

565. Williams, C. B. Soybeans: a future economic factor in North Carolina. N. C. Agr. Col. Ext. Circ. 57, 11pp. Raleigh and West Raleigh, 1917.

The writer treats his subject under the following heads: Soybeans versus cowpeas; Soybeans versus peanuts; Soybeans for the improvement of the soil; Soybeans for feed for live stock; Soybeans for human consumption; Utilization of soybeans by cotton oil mills; Products secured by oil mills in crushing soybeans.

566. Winters, S. R. The soybean, the "wonder" bean. Hoard's Dairyman 82(12): 370. June 25, 1937. 44.8 H65

The author points out the increase in production of soybeans in the United States, the uses for the crop as food and in industry as well as on the farm.

567. Zmigrod, Stanislaw. Oil and flour from the soy bean. Przenyse Chemiczny 14: 116-117. 1930.

. Not examined.

"A review of the properties and uses of soy-bean oil and flour." - Chem. Abs. 24(19): 4947. Oct. 10, 1930.

### Industrial Uses

568. Barnard, H. L. Value of the soybean. Flour & Feed 36(11): 19-20. April 1936. 298.8 F66

"It is not my purpose, however, to discuss the values of soybeans in terms of human or animal food. I wish to point out new uses which are potentially of great importance which offer new outlets for farm crops. It is these uses which will open markets for this century-old legume without displacing crops which are of themselves sufficient for the need..."

The work of the Farm Chemurgic council in studying soybeans as an industrial raw material, is mentioned.



569. Barr, J. E. What price soybeans? 5pp., processed. [Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, Division of hay, feed and seed, Nov. 1, 1933] 1:9 Ec712Wp

"The soybean industry in the United States is making definite progress and it is more and more evident that this crop is destined to play a leading part in our agricultural and industrial life. This is apparent more from the development of broader commercial uses for the soybean than from the steadily increased production during recent years. The latter will be encouraged by prices which are attractive to growers; these prices in turn will depend greatly on the outlet for soybean products for industrial purposes. There are definite indications that this field is developing and that with more nearly normal industrial activity, it can absorb the products from more soybeans than are now produced in the United States."

570. Beckel, A. C., Brother, G. H., and McKinney, L. L. Protein plastics from soybean products. Relation of water content to plastic properties. Indus. and Engin. Chem. 30(4): 436-440. April 1938. 381 J825

"Literature cited", p. 440.

Results of a study made at the U. S. Regional Soybean Industrial Products Laboratory, Urbana, Ill.

"Soybean protein has been found to possess properties which permit the production of two different types of plastic material. Addition of water to soybean protein or meal leads to a product similar to casein plastic, whereas reduction of the moisture content below 5 per cent gives a zeinlike plastic. A new method for measuring plastic flow has been developed and applied." - Ed. note.

571. Berthelot, Albert, Amoureux, G., and Deinse, F. van. Sur les avantages de la peptone pepsique de tourteau de soya pour la préparation des milieux de culture. Société de Chimie Biologique. Bulletin 16(9): 1565-1567. November 1934. 383 Sol.

Describes the advantages of using peptone in cultural media which has been prepared by the peptic digestion of soybean press-cake.

572. Burlison, W. L. Soybean for plastics. Grain & Feed Jours. Consolidated 77(8): 362. Oct. 28, 1936. 298.3 G762

"The soybean is proving to be an excellent source of raw material for the plastic industry. From a ton of soybeans are produced about 250 pounds of oil, and 1600 pounds of meal containing approximately 40 percent protein..."

573. Chang, Ke-Chung, and Chao, Yung-Sheng. Vegetable casein from soybean and peanut. Chinese Chem. Soc. Jour. 3(2): 177-182. June 1935. 385 Q443

Experiments in obtaining the casein and its preparation for glue and plastics are described.

574. Chase, Herbert. Soya bean plastics. Brit. Plastics 7(83): 516, 519-521; (84): 564. April-May 1936. Libr. Cong. TP986.A1B6  
Utilization of the soybean in the Ford plant and method of preparing the plastic material.
575. Corman, R. H. The soybean. Penn State Farmer 2(8): 311, 318. May 1937. 276.8 P38  
The advantages of the crop, processing the beans, and uses for the soybean in industry are discussed. The writer concludes that "if the people of the United States wish to improve the soybean industry, the farmers will have to cooperate with the manufacturers to carry on chemical research and establish more and better by-products from the soybean industry."
576. D'yachenko, P. [Plastics from the vegetable casein of the soy bean.] Plasticheskie Massui, no. 2, pp. 13-15. March-April 1933.  
Not examined.
577. Farm chemurgic council. A plan coordinating agriculture, industry and science. 40pp., processed. Dearborn, 1935. Pam. coll. (Chemurgy)  
Points out, pp. 3-5, the growing interest in soybeans as industrial raw material, and lists needed research for this purpose.
578. Ford soy bean requirement 1,000,000 bushels yearly for million car output. Automotive Indus. 73(17): 541. Oct. 26, 1935. 291.8 Au82  
Methods of utilizing the soybeans in the Ford Motor Company's plant.
579. Ford uses soya bean in plastics. Chem. and Metall. Engin. 42(6): 313. June 1935. 381 E12  
Quotes statement sanctioned by the Ford Motor Co. on the utilization of soybean oil and meal in the Ford plant.
580. G., M. Soya-bean casein glue. Veneers 22(6): 37. June 1928. 99.82 V55  
Reply to a series of questions by Fox in Veneers 22(5): 36. May 1928, as to whether soybean casein glue is a true glue, its strength as compared with other glues, the extent of its development and use in the trade, its durability, its spread, its degree of workability and its price in relation to other glues.
581. Galley, H. W. Industrial use of soybeans. Grain & Feed Jours. Consolidated 74(4): 161. Feb. 27, 1935. 298.8 G762  
"From a paper read...at convention of the Farmers Grain Dealers Ass'n of Illinois."  
Need for cooperation between the farmer and processor and the need for tariff protection on soybean oil and meal are stressed.
582. Génin, G. La caséine végétale; propriétés et emplois. L'Industrie Chimique 18(214): 784-785; 19(216): 6-8. November 1931; January 1932. 383 In2



In this article are described the preparation of the vegetable milk from soybeans from which the casein is derived, the preparation of casein in industry, and its industrial uses.

Abstracted in Le Génie Civil 100(14): 352. April 2, 1932.  
290.8 G29

583. Grodzinski, Paul. [Pressed artificial resin objects in automobile construction.] Kunststoffe 26: 141-144. 1936.

Not examined.

"This illustrated review emphasizes soybean resin products." - Chem. Abs. 30: 7719. November-December 1936.

584. Hadert, Hans. Sojabohnenerzeugnisse in der lack- und klebstoffindustrie. Der Farben-Chemiker 7(12): 452-455. December 1936.  
Bur. of Standards, no. 46592

A discussion of the utilization of the soybean in the varnish and adhesive industries.

Also in Gelatine, Leim, Klebstoffe 4: 207-213. 1936. (Not examined)

585. Hori, S., and Bokura, U. Soy bean cake as a substitute for peptone in the preparation of the nutrient media. Phytopath. Soc. Japan. Ann. 1(1): 27-31. 1918. 464.9 P562

Not examined.

"After experiments with commercial material including ammonium sulphate, Kinako powder, and soy bean cake, it was found that the most satisfactory results were given by soy bean cake. Information is furnished regarding the preparation and expense of this medium." - Expt. Sta. Rec. 42(4): 334. March 1920.

586. Horvath, A. A. Soya phosphatides. Jour. Chem. Ed. 14(9): 424-426. September 1937. 381 J826

The author describes the two products, lecithin and cephalin, methods of extracting them, and their uses.

587. Horvath, A. A. The soybean industry. 221pp. New York, The Chemical publishing co., 1938. 309 H78  
Bibliography, pp. 191-197.

Among the subjects taken up in this work are the various processing methods for the soybean, commercial and laboratory extraction of phosphatides, the refining of soybean oil and uses for the oil, uses of the phosphatides, and the preparation of plastics.

588. Iinuma, Toru, and Mashino, Minoru. On the properties of soya bean protein. I. The influence of the preceding treatments on the solubilities of protein; II. Solubility of soya bean protein in calcium thiocyanate solution; III. Shearing strength of soya bean protein as adhesive; IV. Properties of the protein as water paint; V. Reactivities with formaldehyde; VI. The supplementary studies

of the properties of soya bean protein. Soc. Chem. Indus. Japan Jour. 36(6): 310B-311B; (7): 373B-375B; (8): 455B-456B; (9): 506B-507B. June-September 1933. J385 J82

These are English abstracts in the supplemental binding of a series of articles in Japanese in the main binding of the periodical.

589. Jardine, James T. The use of Bankhead-Jones funds to promote a co-ordinated program of research between the states in cooperation with the United States Department of agriculture. 14pp., processed. [Washington, D. C., U. S. Dept. of agriculture, Extension service, 1936?] 1.9 Ex892Use

"Presented before the Experiment Station Subsection of the Association of Land-Grant Colleges and Universities, at the Houston meeting, November 17, 1936."

The principles and procedure in founding research laboratories under the Act are given, including (p. 7) the soybean research laboratory at the University of Illinois.

590. [Knight, Henry G.] New markets for soybeans. Prairie Farmer (Ill. ed.) 108(7): 4, 27. March 28, 1926. 6 P883B

"Still wider markets for Illinois' lustiest infant farm industry are expected to follow the establishment of a new government soybean research laboratory at the University of Illinois..."

"Director will be Dr. O. E. May, working under Dr. Henry G. Knight, chief of the United States Bureau of Chemistry and Soils, and an advisory committee representing the states of Illinois, Indiana, Iowa, Minnesota, Wisconsin, Michigan, Ohio, Missouri, Kansas, Nebraska and the Dakotas..."

Most of the article comprises a statement made to the Prairie Farmer by Dr. Knight, who discusses the objectives of the new laboratory, and the reasons for its establishment. "Funds for operating this laboratory come from the Bankhead-Jones Act which provides for a limited number of laboratories in the major agricultural regions."

591. [Knight, Henry G.] The useful soybean. 4pp., processed. Washington, D. C., 1938. Pam. coll.

"A Radio Talk presented Thursday, February 3, 1938, under the auspices of Science Service, over the Columbia Broadcasting System..."

This is an interview by Mr. Watson Davis, director of Science Service, with Mr. Henry G. Knight, Chief of the Bureau of Chemistry and Soils. Mr. Knight describes the work of the U. S. Department of Agriculture's Regional Soybean Industrial Products Laboratory at Urbana, Illinois; the numerous uses in industry for the soybean and the making of plastics from it; and the great expansion and increase in the production of soybeans in the United States in the past few years. Twelve state agricultural experiment stations are said to be cooperating with the soybean laboratory.



592. Kraybill, H. R., Smith, R. L., and Walter, E. D. The isolation of sucrose from soybeans. *Amer. Chem. Soc. Jour.* 59(11): 2470-2471. November 1937. 381 Am33J  
Methods used in obtaining sucrose from soybeans.  
"Department of Agricultural Chemistry, Purdue University Agricultural Experiment Station, Lafayette, Indiana, and the Regional Soybean Industrial Products Laboratory, U. S. Department of Agriculture, Urbana, Illinois." - Signature at end of article.
593. Lin, F. C. [A soy-bean digest medium for diagnostic work.] *Chinese Med. Jour.* 48: 571-576. 1934.  
Not examined.  
"...This medium can replace the more expensive meat infusion in routine work, and may also be employed for the preservation of stock cultures." - *Chem. Abs.* 29: 1114. Jan.-May 1935.
594. Lougee, E. F. Industry and the soy bean. *Modern Plastics* 13(8): 13-15, 54-57. April 1936. 309.8 P69  
This is an account of the "experimental development of soy bean plastics by the Ford Motor Co. The information was obtained by personal interviews with Ford executives both in the Engineering Laboratory at Dearborn and in the River Rouge molding division of the company."  
The article quotes Mr. Ford's theory of making partners of industry and agriculture, since the one needs employment for its surplus men, and the other lacks a market for its product. This has resulted in the starting of a large plastic plant to utilize agricultural products such as the soybean. "The general plan is to produce a simple processing unit which will satisfactorily separate the oil from the beans. This unit is to be available to farmers in rural communities who can raise beans in the summer and process them in winter."
595. McCarroll, Hudson. Address of Hudson McCarroll, Chief chemist of Ford motor Co., at Illinois farmers grain dealers Convention, Chicago. *Farmers' Elevator Guide* 31(4): 3-5. Apr. 5, 1936. 280.28 Am3  
The work done at the Ford plant at Dearborn, Michigan, in utilizing the soybean in the automobile industry, and the process followed, are described.
596. Maruri, Aurelio. Cultivo del frijol soya. *Revista de Agricultura [Cuba]* 20(1): 37-49. January 1937. 8 Ag88Re  
The industrial uses for the soybean and its importance in the United States are brought out.
597. Más información sobre el frijol soya y su importancia industrial. *Revista de Agricultura [Cuba]* 20(6): 111-113. June 1937. 8 Ag88Re  
This is a discussion of the soybean and its industrial importance. It takes up the various uses for the bean, extraction of the oil, and the industrial possibilities of the crop for Cuba.

598. Masse, Sidney M. Soybean extract as a deflocculating and decolorizing agent. Chem.-Analyst no. 27, pp. 18-19. October 1918. 381 C424  
"Clouded solutions, especially those of an albuminous nature, may be quickly cleared by an extract prepared from the bean. In serology its use may be adapted for separating blood corpuscles from the serum with fine results." The preparation of the extract is outlined.
599. Mecheels, Otto. Lecithin in der textilindustrie. Melliand Textilberichte 12(2): 123-124. February 1931. 304.8 T312  
The writer discusses the use of lecithin obtained from soybeans in the textile industry and methods to be followed in preparing it.
600. Midwestern conference of agriculture, industry and science, Omaha, Neb., 1937. Condensed proceedings of the Midwestern conference on agriculture, industry and science, Omaha, Nebraska, March 9-10, 1937. 125pp., processed. Dearborn, Michigan, Farm chemurgic council, 1937. 381.9 M585  
Industrial utilization of farm products, by Dr. Henry G. Knight, pp. 10-16, contains a paragraph on the Soybean Products Industrial Utilization Research Laboratory at the University of Illinois.  
The soy bean, by I. C. Bradley, pp. 71-75, traces the increasing importance of the soybean industry and the "sequences of events which have brought the soy bean into such prominence."  
U. S. Regional Soy Bean Industrial Products Laboratory, by O. E. May, pp. 75-80, outlines the plan and objectives of the Laboratory, and describes the projects that have been undertaken in the industrial utilization of the soybean.
601. Minatoya, S., and Kurahashi, N. The effect of soya-bean-lecithin on vulcanization of rubber, and the manufacture and uses of powdered rubber prepared by the use of soya-bean-lecithin. Soc. Chem. Indus. Japan Jour. 37(4): 477-479. April 1934. J385 J82  
Article in Japanese.  
Alternate title and abstract in English in supplementary binding, pp. 207B-208B.  
"Soya-bean lecithin has the same effect as the lipin of Hevea latex on the vulcanisation of rubber. Soft rubber articles made from raw rubber powder prepared with the aid of this lecithin are inferior in physical properties to those manufactured from standard raw rubber, e.g. smoked sheet, but ebonite so prepared compares favourably with that from ordinary rubber except in electrical qualities." - D. F. T. in Brit. Chem. Abs (Suppl. to Soc. Chem. Indus. Jour.) B: 726. Aug. 24, 1934. 382 B773
602. Morse, William Joseph, and Fuller, G. C. Soybean investigations in the United States. Herbage Reviews 1(2): 55-58. June 1933. 64.8 Im7H



"The soybean is no longer an unfamiliar crop to most farmers of the United States and it has also become in a brief period the object of considerable attention of numerous industries. In spite of the extensive investigations that have been conducted with the soybean, the work of developing this plant to its fullest possibilities is just beginning. The explanation for this lies in the fact that the major part of our studies to date have been devoted to the adaptation and development of new varieties. More recently our attention has been called to the great value of the soybean as a food crop and for industrial purposes. At the moment our attention and that of the agricultural worker generally is focussed on these additional potentialities of the soybean and its by-products - oil and meal - and the crop is gradually assuming its rightful proportion of a major crop in the agriculture of the United States."

603. New fiber made from soybean protein to be used in autos. Sci. News Letter 33(19): 302. May 7, 1938. 470 Sci24

"A new synthetic fiber, made from the protein material of soybeans, was exhibited for the first time by Dr. R. A. Boyer of the research department of the Ford Motor Company before the meetings of the Fourth Annual Conference of the Farm Chemurgic Council, at Omaha.

"The new fiber, destined for use in automobile upholstery, was developed as an outgrowth of work by Italian chemists in making a synthetic wool from milk casein..."

The ways in which soybeans may be used in automobile manufacture are listed, and the blending of soybean oil and tung oil as a mixture for use in paints is briefly discussed.

604. Palladin, N. V., and Sitin, L. A. Die gewinnung von technischen sojaciweiss ("Rasein") und seine verwendung zur leinherstellung. Moscow. Zentrales Biochemisches Forschungsinstitut der Nahrungs- und Genussmittelindustrie. Schriften 1(6): 235-264. 1932. 389.9 M85

Text in Russian. Alternate titles and conclusions in German.

Describes the obtaining of commercial soybean casein and its use in making adhesives.

605. Plastic made of soybean offers use for farm products. Sci. News Letter 33(5): 71. Jan. 29, 1938. 470 Sci24

Brings out very briefly the uses for soybean plastic in the Ford plant, the research being done at the Soybean Industrial Research Laboratory at Urbana, Illinois, the great increase in soybean acreage in this country, and the industrial uses of the bean.

606. Rewald, B. The phosphatides as commercial products. Chem. Trade Jour. and Chem. Engin. 101(2619): 86-87. July 30, 1937. 382 C422

"From paper (in German) presented to the...Fifth International and Chemical Congress of the Agricultural Industries." - Note.

The soybean is described as the predominant source of phosphatides in the vegetable line, and the chemical characteristics of the soybean phosphatide, usually known as "lecithin," and its uses in the foodstuffs industries and in rubber and leather manufacture are considered.

An extract from this paper is published under the title "Lecithin in food products" in *Canad. Chem. and Metall.* 21(8): 292, 307.

August 1937. 381 C16

Another extract entitled "Phosphatides as commercial products" is printed in *Chem. Indus.* 41(3): 253-254. September 1937.

381 C426

607. Rickey, Lacey F. Processing soybeans. *Flour & Feed* 34(10): 20-21. March 1934. 298.8 F66

"This paper will attempt to set forth briefly the chief products made from soybeans and the methods used in processing the beans."

608. Rothéa, F., and Nielloux, F. La lécithine végétale de soja. *Journal de Pharmacie et de Chimie* 18(10): 443-445. Nov. 16, 1933. (125e Année, 8e Série.) 383 J825

The extraction of vegetable lecithin from the soybean with the object of using it in the manufacture of chocolate.

609. Salazar, Leopoldo G. The manufacture and chemical control of some soybean products under Los Baños conditions. *Philippine Agr.* 15(4): 219-231. September 1926. 25 P542

"Thesis presented for graduation, 1925, with the degree of Bachelor of Agriculture, no. 231; Experiment Station contribution no. 380..."

"Literature cited," p. 230.

"The objects of this work were: (a) to determine the possibility of preparing toyo [soy sauce] and tokua [bean curd] under Los Baños conditions; and (b) to determine the time at which the toyo contains the highest percentage of nitrogen."

610. Sato, Masanori. Preparation of a liquid fuel resembling petroleum by the distillation of the calcium-salt of soya-bean fatty acids. *Jour. Chem. Indus. Japan* 25(287): 13-24; 26: 297-304; 29(3): 109-115; 30(4): 242-267; January 1922, 1923, March 1926, April 1927. J385 J82

Text in Japanese.

Title varies slightly.

3d report has English title: "On the Preparation of Fuel Oil by Distillation of the Lime Soap of Soya Bean Oil," and is by Masanori Sato and Kwong Fong Tseng.

Abstracts of the articles in English are contained in the Supplementary Binding, pp. 2-5, January 1922; pp. 23B-24B, March 1926; pp. 73B-74B, April 1927.

Divided into 7 reports.



5th Report is by Masanori Sato and Hiide Matsunoto; 7th is by Masanori Sato and Chiyomatsu Ito.

611. Satow, Sadakichi. Manufacture of plastic products from proteid of soy bean. Tôhoku Imp. Univ. (Sendai, Japan) Technol. Repts. 3(4): 199-267. 1923. Libr. Cong. Tl.S616

The author first "followed Dr. T. B. Osborn's process in order to isolate the soy bean proteid, glycinine...

"He glutinized the isolated proteid...to a transparent pasty mass and then converted the mass into a hard product by means of the action of formaldehyde.

"Thus, (1) the special process in the isolation of proteid, (2) the glutinization process, and (3) the condensation process greatly differentiate the author's processes from those of former investigators.

Products manufactured from the soybean proteid are listed, pp. 266-267.

612. Satow, Sadakichi. The proteins of sojabean and their industrial applications. Jour. Chem. Indus. Japan 22(260): 851-877; (261): 953-968; (262): 1045-1058; 23(263): 1-25; (264): 109-135; (265): 219-236; (266): 321-342; (267): 425-439; (268): 527-543; (270): 811-830; (271): 905-910. October 1919-June, 1920, August-September 1920. J385 J82

Article in Japanese.

Alternate title and abstract in English in the Journal for September 1920, pp. 23-27.

Methods of extracting the oil are discussed.

613. Scherer, Robert. Casein; its preparation and technical utilisation; translated from the German. Ed. 3, rev. and enl., 216pp. London, Scott, Greenwood & son, 1921. 309 Sch2C

"The first part of this book treats upon the preparation of curd from milk, by decomposition of the suspended casein compound with acids or with rennet, and the purification and drying of the precipitated casein. Following this, the composition, properties, and reactions of casein are touched upon; then follows a description of the use of casein in the manufacture of paints, distempers, putties, plastic masses, artificial ivory, and other materials; the modes of applying these and their special features. The use of casein as a dressing for paper and cloth and its employment for waterproofing and other purposes is also described, and finally there are chapters on the use of casein in nutrient preparations, and the compounds of casein employed for medicinal purposes." - Preface, p. iv.

Ch. II. Casein: its origin, preparation and properties, pp. 3-29, has a section, p. 29, on Vegetable Casein, which describes a method for extracting casein from soybeans.

614. Shen, Tze-Hui, and Sun, Wei. [The preparation of emulsion paints from soybean casein.] Chiao-Tung Univ. Research Inst. Bur. Chem. Ann. Rept. 3: 52-62. 1936.  
"The use of soybean casein as a substitute for milk casein in the manuf. of emulsion paints was investigated." - Chem. Abs. 31(9): 3303. May 10, 1937.
615. Silk from soy beans. New York Times, May 31, 1938. Pan. Coll. (Soybeans.)  
This is a brief account taken from The Observer of London, on the making of silk from the soybean by Ryojei Inouye, a Japanese scientist. For his discovery Mr. Inouye has been awarded the Fujii prize by the Japan Physical and Chemical Research Society.
616. Sorensen, S. O. The outlook for soybeans in Minnesota. 5pp., processed. St. Paul, Minn., Feb. 11, 1938. Pan. Coll.  
A talk given at the annual meeting of the Minnesota Farm Managers' Association.  
"The topic will be considered from the standpoint of the Soybean as a raw material for industrial products and not as a hay and feed crop. The subject may be naturally divided into four points: 1. Are the climate and soil conditions in Minnesota suited to the cultivation of Soybeans, 2. Are there facilities available for processing Soybeans in Minnesota comparable to those in other regions, 3. Are the claims being made that there will be a greatly increased market for Soybean products in industrial fields if the crop is further increased, justified, 4. Of the crops which at least partially serve as a raw material for industry thus helping to diversify the markets for farm products, are Soybeans the best suited to Minnesota conditions?"  
This article is abstracted in Markets 1(8): 11. April 14, 1938, under title: Soybean Situation in Minnesota is Analyzed.
617. Southern chemurgic conference, Lafayette, La. Condensed proceedings of the Southern chemurgic conference, Lafayette, Louisiana, October 15-17, 1936; Gulf coast chemurgic conference and the Tung oil association of America, Pensacola, Florida, October 20, 21, 1936. 180pp. Dearborn, Mich., Farm chemurgic council, 1936. (File no. 69) 281.9 So84  
"Cooperating with both Conferences were: The Chemical Foundation, Inc., and Farm Chemurgic Council."  
Industrial utilization of soy beans, by R. L. Himes, pp. 113-114. Soybeans as utilized at the Louisiana State Penitentiary, Baton Rouge, La.
618. The soy bean industry. Oil Miller and Cotton Ginner 41(2): 3-5. October 1932. 307.8 Oi5  
Includes extracts of speeches delivered at the Washington meeting of the American Soybean Association, September 2 and 3, by W. H. Eastman on the Industrial Development of the Soybean Industry,



and A. A. Horvath who "stressed the importance of soybean flour as a national food of great importance because of its peculiar nutritional qualities." The history of the soybean crushing industry is traced, and the need for removal of prejudice against domestic soybean oil, the standards set up by the National Soybean Oil Manufacturers Association, the types of industries consuming the oil, and soybean trade conditions in the past year are considered.

619. Soybean plastic. Science 87(2246, Suppl. Science News): 8, 10. Jan. 14, 1938. 470 Sci2

A brief outline of research being done in soybean uses, and the uses to which soybeans and the plastic may be put.

620. Takayama, Yoshitaro. Utilization of the soybean. Soc. Chem. Indus. Japan Jour. 30(11): 194B-195B; 31(4): 77B-78B; 33(6): 91B-92B; 34(1): 31B-32B. November 1927, April 1928, March 1930, January 1931. J385 J82

These are English abstracts in the supplementary binding of Japanese articles in the main binding.

The first part deals with the "extraction of crude protein from the soybean cake or bean to utilize it as protein decomposition products."

The second part "deals with the treatment of the soybean with dilute sulphuric acid..."

621. Tanaka, Soichiro. On the manufacture of potash-lye from vegetable ashes and its application for the straw boiling process in the paper-making industry. Jour. Chem. Indus. Tokyo 20(234): 844-850. August 1917. J385 J82

"Various kinds of vegetable ashes were analyzed, but in the exptl. prepn. of KOH, only the soy bean pod ash and chestnut ash were used, owing to the deficiency of the other ashes. On lixiviating the soy bean pod ash containing 16.19% of  $K_2CO_3$  with  $H_2O$  and adding CaO to the filtered liquor a yield of 52.7% KOH was obtained. On adding  $H_2O$  to the same ash and heating, and then adding CaO without filtering, the yield of KOH was 42.2%; chestnut ash containing 13.96%  $K_2CO_3$  similarly treated, but with 3 lixiviations, yielded 75.5% KOH; after 4 lixiviations, 85.6%. The yield of the lye apparently depends upon the filtering process. The lye obtained from the soy bean pod ash was used for boiling straw and the straw thus treated was further bleached with bleaching powder, the results being satisfactory..." - Chem. Abs. 12(3): 309-310. Feb. 10, 1918.

622. Tarle, M. The soya bean and casein. China Jour. 20(4): 187-190. April 1934. 475 C44

The industrial uses for the casein, amount of production in various countries, and the method of extracting it are brought out. Its production on a large scale is urged for China.

623. Taylor, Robert L. How soybeans help build Fords. Chem. and Metall. Engin. 43(4): 172-176. April 1936. '381 E12  
The ways in which soybeans are utilized in the automobile industry, the processes used, and Henry Ford's plan for the union of agriculture and industry are described. Pictures and a diagram show the machinery used in the processes.
624. Turner, F. Soya beans and soya bean oil. Oil and Colour Trades Jour. 87(1894): 311, 313-314. Feb. 1, 1935. 306.8 O152  
Paper read at a meeting of the Borough Oil and Colour Students' Association on January 17.  
Methods of oil extraction, separation of the proteins, the use of the protein in paints, the use of lecithin obtained from the beans, and the use of the oil in paints are discussed.  
A translation of this in French appears under the title "Les Graines de Soja et l'Huile de Soja" in Les Matières Grasses 27(327): 10538-10540; (328): 10563-10564. July 15-Aug. 15, 1935. 307.8 M42
625. [Van Vlissingen, Arthur, Jr.] Automobiles and soybeans. An interview by Arthur Van Vlissingen, Jr., with Henry Ford. Rotarian 43(3): 6-8, 58-59. September 1933. Libr. Cong. HF5001.B7  
Utilization of the soybean in the automobile industry is discussed. Mr. Ford is quoted as saying:  
"Anything that can be grown for industry's raw materials will bring new revenue to agriculture, will help to raise prices of old-line, conventional crops. It will thus add doubly to the purchasing power of the farmers, and so will directly increase industrial activity and employment."
626. Wand, Frederick A. Varieties of soy beans best for manufacturing. Grain Dealers Jour. 62(3): 162. Feb. 10, 1929. 298.8 G76  
A letter to the Grain Dealers Journal, listing the best varieties for manufacturing purposes, and pointing out the large potential market for soybean products.
627. Whole industries thrive on soy beans. Business Week (18):35-36. Jan. 8, 1930. 280.8 Sy8  
The various uses for the soybean in industry are outlined and the plan worked out between Illinois farmers and the industrial users in 1928 and 1929 whereby the manufacturers guaranteed a minimum price to farmers for soybeans is cited.
628. Wieseahn, G. A. Soybean phosphatides and their uses; a review. Oil & Soap 14(5): 119-122. May 1937. 307.8 J82  
List of references, p. 122.  
"In pointing out the more or less successful, and wide application of soybean phosphatides, this survey also shows the need for further research, primarily towards gaining a clearer conception of the actual composition of the acetone-insoluble material of the 'lecithin' and of its effects, investigations of which have so far been undertaken in but a few fields."



629. Wong, T. Soy-bean industries. Jour. China Soc. Chem. Indus. 1: 83-92; 2: 139-144. 1923-24.  
Not examined.  
"Methods of ppn. and analyses are given for 9 products manufactured from soy bean, including oil, bean curd, bean milk, etc..." - Wm. H. Adolph in Chem. Abs. 17(14): 2514. July 20, 1923. (Abstract for first article.)  
"Soy-bean cake contains 42.1% protein and 9.6% oil. This might be used for the manuf. of artificial marble and similar products." - W. H. A. in Chem. Abs. 19(10): 1634. May 20, 1925. (Abstract for second article.)
630. Working, E. J. Have soy beans moved up? Ill. Farm Econ. no. 22-23, pp. 104-107. Urbana. March-April 1937.  
"Soybeans have moved up from the feed lot to the paint factory and finally to the kitchen. Statements such as this have often been made in the last two years, and the facts back of them are of great importance to soybean growers." Statistics are given to support these facts, and it is concluded that "if soybean oil is to maintain the importance it has gained during the last two years it will presumably be at the expense of selling at a lower price relative to other oils than it did prior to 1934. Thus, altho soybean oil consumption may be said to have moved up to the edible class; from the point of view of price it would perhaps be better to say that soybean oil has moved down from the drying oil to the edible oil class. The above, however, should not be taken to indicate that there will be a very drastic decline of soybean oil prices...we are in a period of generally increasing demand which will tend to counteract in part the future production increases..."
631. Yarn from soybean. Science 87(2264): 10. May 20, 1938. 470 Sci2  
"Development of the process for converting soybean protein into fiber is credited to Ryojei Inouye, awarded recently the Fujii prize of the Physical and Chemical Study Council of Kyoto Imperial University, one of Japan's 'big six' universities, for his accomplishment."

Oil, Oilmeal and Oilcake

632. American society for testing materials, Sub-committee III of Committee D-1. Hexabromide test for determining purity of linseed oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 99, 16pp. [n.p.] July 1920. 306.9 P162C  
Henry A. Gardner, Chairman.  
"National Varnish Manufacturers' Association (Co-operating)."  
Includes the directions sent to the members of the sub-committee, pp. 2-12, (Published as Circ. 83, by H. A. Gardner), and the results obtained by the various observers in using this test for linseed and soy oil, pp. 13-16.

633. Belyaev, N. [Use of soybean oil in paints.] Masloboino Zhirovoo Delo, no. 6(whole no. 47), pp. 15-16. 1929. 307.8 M37  
Text in Russian.  
"The oil cannot substitute linseed or hempseed oil." - Chem. Abs. in Brit. Chem. Abs. B: 1038. Nov. 14, 1930. 382 B773
634. Bingham, Albert B. The use of soya bean oil in paste colors. Drugs, Oils and Paints 35(10): 369-370. March 1920. Libr. Cong. TPl.D7  
"Inasmuch as no real objection to the use of soya bean oil as a grinding vehicle for paste colors has been advanced, and since several specific advantages result from its use as such, it seems desirable that every effort should be made to overcome the prejudice against its use for this particular purpose."
635. Borushko, Michael. Soy-bean oil in the paint and varnish industry. Federation Paint Varnish Production Clubs, Off. Digest. No. 137, pp. 184-190. 1934.  
Not examined.  
"The history and the non-painting uses of soy beans and their oil are briefly described. The extn. method of obtaining the oil is preferred because of purity, uniformity and completeness. The literature on the suitability of the oil is reviewed and suggestions for study are given." - Chem. Abs. 28(17): 5688. Sept. 10, 1934.
636. Bowden, Arthur. Use of soybean meal for adhesive purposes. Oil & Soap 14(5): 114. May 1937. 307.8 J82  
"A paper presented at the Fall meeting of the American Oil Chemists' Society, at Chicago, October 8-9, 1936."  
Results of tests on the relative strength of treated and untreated soybean meal are cited.
637. Brightman, R. Note on a deposit in refined soya bean oil. Soc. Chem. Indus. Jour. 38(10): 120T-121T. May 31, 1919. 382 M31  
Read at a meeting of the Manchester section, March 7, 1919.  
This is a chemical study of deposit found in soybean oil which had been refined by means of sulphuric acid. Saponification and iodine values for the oils studied are given.
638. Burlison, W. L. Recent developments in the utilization of soybean oil in paint. Ill. Agr. Expt. Sta. Circ. 438, 8pp. Urbana, 1935.  
"Reprint of an address delivered at the annual meeting of the American Soybean Association, Evansville and Lafayette, Indiana, August 21-23, 1935..." [q.v.]  
The rapid progress in the development of industrial uses for the soybean, the studies made by the Illinois Station on the use of soybean oil for paint, and statements by members of the paint industry of the value of soybean oil, are cited.



639. Burton, C. S. Industrial magic in beans. Mag. Wall St. 58(12): 702-703, 737. Sept. 26, 1936. 286.8 M27

The industrial uses of soy oil and cake, and the advantages of the crop to the farmer are discussed.

640. Bush, Guy. Soybean mills for Iowa. Wallaces' Farmer 55(14): 687. Apr. 5, 1930. 6 W15

The writer describes the operation of the soybean mill at Centerville, Iowa, which turns out oil and cake.

641. Busy soybean processor. Grain & Feed Jours. Consolidated 79(1): 29. July 14, 1937. 298.8 G762

An account of the operation of the soybean processing plant of Ralph Wells & Co., Monmouth, Ill.

642. Casberg, Carl H., and Schubert, Carl E. An investigation of the suitability of soy bean oil for core oil. Ill. Engin. Expt. Sta. Bull. 235, 22pp. Urbana, 1931.

"Since some core oil manufacturers have used soy bean oil as a diluent for core oils, it has been suggested that an investigation should be undertaken in order to determine the suitability of soy bean oil either as a substitute for, or a diluent of, other oils used for the purpose of making cores. In response to these suggestions tests were conducted on various soy bean oils, each oil being designated by a letter, to serve as identification in this report."

643. Cole, L. J., Lindstrom, E. W., and Woodworth, C. M. Selection for quality of oil in soy beans. U. S. Dept. Agr. Jour. Agr. Research 35(1): 75-95. Washington, D. C., July 1, 1927. 1 Ag84J

"Paper No. 71 from the department of genetics, agricultural experiment station, University of Wisconsin..."

"Literature cited", pp. 94-95.

It is said that soybean oil has in the last few years become an important factor in the paint industry, since it is much cheaper to use than linseed oil. Its drying quality is, however, lower than that of linseed oil, and breeding experiments have been made in an effort to increase the drying quality of soybean oil. This paper gives the results of these tests.

644. Conant, L. C. Soy bean oil. A new cash crop for Vermont. Bur. Farmer (Vt. Farm Bur. News) 11(2): a-b. November 1935. 280.82 B89

"In short, if we are to keep in step with the rest of the world, we must look about for improvement in our present crops and for new ones which may supplement the inevitable and, at present, all-important milk check." The writer discusses the possibilities of the soybean in solving these two problems, and the project to test the theory being carried out by a group of men in cooperation with the state Farm Bureau, the Extension Service and Experiment Station.

645. Cox, C. H. Report of soy bean analysis committee. Oil & Soap 14(8): 213-214. August 1937. 307.8 J82  
"The work of the Soy Bean Analysis Committee [of the American Oil Chemists' Society] this year has been confined to the further study of the method presented at the New Orleans meeting last year."
646. Cox, C. H. Soy bean analysis. Oil & Soap 13(7): 167-168. July 1936. 307.8 J82  
"A paper presented at the Spring Meeting, A.O.C.S., New Orleans, May 28 and 29, 1936."  
Methods followed in the analysis of soybeans for oil mill purposes. It is said that "the procedure for cottonseed must be considerably changed for the analysis of soy beans."
647. Crandell, John S. Possibilities of the stabilization of earth roads with soy bean oil. Ill. Engin. Expt. Sta. Circ. 30, pp. 54-55. Urbana, 1937. (University of Illinois Bulletin, vol. 34, no. 76. May 21, 1937) 290.9 I162 no. 30  
Papers presented at the Twenty-fourth Annual Conference on Highway Engineering, held at the University of Illinois, March 3-5, 1937.  
"In 1936 a thesis on the stabilization of earth roads was written by Fu Hua Chen, a Chinese graduate student, at the University of Illinois...  
"The thesis is available at the University of Illinois library, and therefore the tests run, their significance, and their outcome will not be reported here. It is sufficient to say that the results, judging from a laboratory standard, indicated clearly that soy bean oil will bind the soil particles together, will waterproof the surface of a soil road, and will resist freezing and thawing tests as well as asphalts and tars..."
648. D., R. Die verseifbarkeit des soja-phosphatids. Seifensieder-Zeitung 64(42): 802-803. Oct. 20, 1937. 307.8 Se4  
Chemical methods to be followed in the saponification of soybean phosphatides.
649. Dacy, George H. New products from soy beans. The crop yields valuable meal and oil. Country Gent. 81(23): 1145. June 3, 1916. 6 C833  
"The successful production of soy-bean meal and oil on a commercial scale is notable in that it places on the market a mill feed containing twenty to twenty-five per cent more protein than does cottonseed meal; it affords the soy-bean raisers a new and profitable market outlet for their grain; it provides an oil that is suitable for practically all the purposes for which cottonseed oil is used and that can be sold at a lower price, while it will boom the bean business so that a larger acreage of the soil-improving soys will be raised each year."  
Harvesting methods are also discussed.



650. Davidsohn, J. Die bleichung der oele mit bleicherden. Masloboino-Zhirovoe Delo no. 7-8(12-13), pp. 10-17. July-August 1926. Libr. Cong. TP1.M3  
Text in Russian with alternate title in German.  
Bleaching of oils with fuller's earth. The experiments were carried out with soybean oil.  
Abstract by C. C. D. in Chem. Abs. 22(17): 3310. Sept. 10, 1928.
651. Ditmar, Rudolf. Die bedeutung des sojabohnenöls als dehnungserhöher und als plastikator für die herstellung von kaltvulkanisaten. Gummi-zeitung 41(10): 535-536. Dec. 3, 1926. 305.8 G95  
The writer takes up the importance of soybean oil as an agent for increasing the elongation and as a plasticizing agent in the production of cold-vulcanized rubber.
652. Earle, F. R., and Milner, R. T. The occurrence of phosphorus in soybeans. Oil & Soap 15(2): 41-42. February 1938. 307.8 J82  
Bibliography, p. 42.  
"The phosphorous compounds present in soybeans have been tentatively divided into four groups. Methods for determining these groups have been studied and applied to the analysis of a sample of soybeans." - Abstract, p. 41.
653. Eastman, Whitney H. Domestic soybean oil now appreciated. Grain & Feed Jours. Consolidated 69(11): 527. Dec. 14, 1932. 298.8 G762  
Abstract of address before National Soybean Oil Manufacturers Association.  
Brings out the prejudice formerly existing against domestic soybean oil, and its lessening through the efforts of the National Soybean Oil Manufacturers Association, which set up trading rules and quality standards.
654. Eastman, Whitney H. Soybean oil and meal in industry. Oil, Paint and Drug Reporter 122(11): 17, 34. Sept. 12, 1932. 306.8 Oi5  
Address before the annual convention of the American Soybean Association, Washington, September 2, 1932.  
"The two main products of the soybean oil mills are soybean oil meal, a vegetable protein concentrate, and soybean oil, a semi-drying vegetable oil, and I shall confine my remarks to them, more particularly with respect to their production, distribution, and industrial utilization."  
Extracts under title "Development of the Soybean Oil Meal Industry." Grain & Feed Jours. Consolidated 69(5): 231. Sept. 14, 1932. 298.8 G762  
Also published under the title "Industrial Utilization of Soybean Oil and Soybean Oil Meal" in Paint, Oil, and Chem. Rev. 94(5): 12-13, 19. Sept. 8, 1932. 306.8 Pl6

655. Eastman, Whitney H. Utilization of soybean oil meal. Grain & Feed Jours. Consolidated 69(10): 478. Nov. 23, 1932. 298.8 G762

From a speech before the National Soybean Oil Manufacturers Association.

Outlines the processes used for extraction; the soft pork danger and the perfection of a process by the Trade Association to produce an oil meal with a maximum of 6% oil; and the industrial uses for the oil meal.

656. Eastman, Whitney H. The utilization of the soybean in the oil milling industry. Amer. Paint Jour. 15(46): 56, 58, 60, 62. Aug. 31, 1931. Bur. of Standards.

"An address given before the recent annual convention of the American Soybean Association at Columbia, Mo. - Editor."

"I have shown the scope of the soybean milling industry at the present time, particularly in relation to the continued development of the soybean crop. I have demonstrated that the milling industry is important to the production of soybeans on a large scale, and that a greater and more widespread demand for soybean products is necessary to provide a continued outlet for a large share of the crop. And I have emphasized particularly the importance of a greater consumption of soybean oil meal in order to provide an outlet for the product representing the greatest value of the milling beans."

657. Eddy, C. O. Soybean oil meal emulsifies mineral oils. Ky. State Hort. Soc. Trans., 1933, pp. 139-141. Henderson, Ky. [1933?] 81 K41

"Contribution from the Department of Entomology and Botany of Kentucky Experiment Station..." - Note.

"During the dormant season of 1932-33 laboratory work indicated the possible value of soybean oil meal as an emulsifier for mineral oils for dormant spray purposes. These experiments indicated that an additional saving of 10% could be made on tank-mixed emulsions which now cost in Kentucky about 72c for 200 gallons of 2% finished oil emulsion..."

658. Eisenschiml, Otto. Domestic soya bean oil, its history and its prospects. Paint, Oil and Chem. Rev. 87(12): 12-14, 16. March 21, 1929. 306.8 P16

"A paper read before the March meeting of the Northwestern Paint Superintendents' Club, Minneapolis." - Ed. Note.

"150,000 to 200,000 gallons of domestic Soya Bean Oil per month will have to be sold, at times, in 1929 says the author who predicts a game of tag between the producer and consumer as to who works faster. Sometimes the market will be congested, other times it will be lean and altogether it will remain a thin market for some time to come. A thin market he states always is loaded with sudden and interesting possibilities." - Ed. Note.



Also published under title "Domestic Soya Bean Oil" in Oil & Fat Indus. 6(4): 15-19. April 1929. 307.8 J82; and under title "History and Prospects of Domestic Soya Bean Oil" in Amer. Paint Jour. 13(22): 22, 24, 26, 28, 30. March 18, 1929. Bur. of Standards.

659. Eisenschiml, Otto. Soy beans in industry. Grain Dealers Jour. 64(3): 203. Feb. 12, 1930. 298.8 G76

Abstract of address "before University of Illinois farmers week meeting."

The industrial uses for soybean oil are discussed, and concentrated propaganda for the purpose of making the oil known is suggested.

660. Ellison, R. W. Determining the color of soya bean oil. Cotton Oil Press 4(6): 49-50. October 1920. 307.8 C8234

"In the absence of a standard instrument for accomplishing this purpose, we wish to outline a very simple method for use with any instrument of the type of the Greiner-Wesson-Peep tintometer, which gives very satisfactory results..."

661. Fellers, Carl R. Soy-bean oil: factors which influence its production and composition. Jour. Indus. and Engin. Chem. 13(8): 689-691. August 1921. 381 J825

The chemical characteristics of soybean oil, the oil and protein content of various soybean varieties, and the effect of date of planting upon the composition and maturity of the beans are studied.

662. Flint, W. P., Chandler, S. C., McGovran, E. R., and Farrar, M. D. Progress in control of codling moth in 1934. Ill. State Hort. Soc. Trans. (1934)68: 153-176. [Springfield, 1935] 81 I16

This is in the form of a discussion. Soybean oil in combination with lead arsenate and lime, is one of the products tested for use. (pp. 159-162)

663. Fryer, Percival J., and Weston, Frank E. Technical handbook of oils, fats and waxes. Ed. 3, 2v. Cambridge, Eng., University press, 1920. (Cambridge Technical series.) 307 F94

v. 1, pp. 121-122, Soya Bean Oil. Gives physical and chemical data, method of obtaining the oil, method of refining it, and its properties and uses.

664. Gardner, Henry A. Committee work on hexabronide test for determining purity of soya bean oil or linseed oil, Steele or Bailey method. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 83, 11pp. [n.p.] January 1930. 306.9 P162C

"National Varnish Manufacturers Association (Co-operating)."

These are the instructions sent to members of Sub-committee III of the American Society for Testing Materials who are to cooperate

on the Hexabromide test. Included are the following two papers for making the test: A New Hexabromide test for linseed oil, by L. L. Steele and F. M. Washburn, pp. 2-6; and Bailey's proposed method, pp. 6-11. These methods are applicable to soybean oil.

665. Gardner, Henry A. Driers for soya oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 69, 12pp. [n.p.] August, 1919. 306.9 P162C

Abstract by A. de W. in Soc. Chem. Indus. Jour. 38(21): 833A. Nov. 15, 1919. 382 M31

"The writer has received many requests for information as to the most efficient driers for soya oil. The results of a laboratory investigation that has just been completed, justify, in so far as these tests are concerned, the conclusions given below. It is believed that similar results with soya oil may be obtained by paint manufacturers who are skilled in the treatment of oils."

666. Gardner, Henry A. Examination of commercial American soya bean oil. Inst. Paint and Varnish Research., Ed. Bur. Sci. Sec. Proc. (1923): 117-118. 306.9 P162P

National Varnish Manufacturers' Association cooperating.

Reprint of Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 165.

The author lists the mills that are now (1923) crushing soybean oil and gives an analysis of two samples of soybean oil.

667. Gardner, Henry A. Legitimization of soya bean oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 63, [2]pp. [n.p.] June 1919. 306.9 P162C

"Soya oil has a higher flash point than any other vegetable oil used in the paint industry. It may be heat treated and blown to a viscous form. Its value in varnish making has already been indicated, and it is probable that it will soon be established firmly in the industry. Its further use is suggested."

Also published in Sci. Amer. 121(8): 196. Aug. 23, 1919.

470 Sci25; in Drugs, Oils and Paints 35(2): 48-49. July 1919.

306.8 D; and under title "A Substitute for Linseed Oil in Paint Manufacture. Legitimization of Soya Bean Oil" in Amer. Architect 116(2271): 29. July 2, 1919. 296.8 Am32

668. Gardner, Henry A. Papers on paint and varnish and the materials used in their manufacture. 501pp. Washington, D. C., 1920. Libr. Cong. TP935.G3

"In the present work the author brings up to date the series of technical papers which he has prepared as circulars of the Educational Bureau of the Paint and Varnish Manufacturers Association of the United States, since January, 1919, covering his researches in the technology of paint and varnish..." - Preface.



Ch. I, Resume of soya bean oil investigations, pp. 9-28. Contains material reprinted from Circ. 50 "Soya Oil in Paints"; Circ. 63 "Legitimization of Soya Bean Oil"; Soya Bean Oil in Paste Colors, an article presented by the writer before the Pennsylvania State Association of Master Painters, Jan. 15, 1920; Circ. 60 "Changes in Oil Upon Storage"; extracts from address by L. P. Nemzek before the Mississippi Cottonseed Crushers' Association at New Orleans, as reprinted in Circ. 37.

Ch. II, Driers for soya bean oil, pp. 29-41. Gives the results of laboratory investigations on the most efficient driers for soybean oil.

Ch. V, Changes in oils upon storage, pp. 60-70. Includes, Table 27, p. 64, results with soybean oil in 1911-1919 oil tests.

Ch. VIII, Hexabromide test for determining purity of linseed oil, pp. 96-110. Describes method of determining the purity of raw soybean oil and raw linseed oil by the Steele and Washburn method and Bailey's modification of it, as forwarded to Subcommittee III on the Testing of Paint Vehicles.

Ch. XI, Fume loss in boiling oils, pp. 138-140. Table 45, p. 140, shows the specific gravity of soybean oil, the percentage weight loss and the percentage volume loss in processing.

669. Gardner, Henry A. Physical and chemical examination of paints, varnishes, lacquers and colors. Ed. 7, 1178, A1201-A1448pp. Washington, D. C., Institute of Paint and Varnish Research, 1935. 306 G172P4 Ed.7

Brief mention is made of trading rules established by the Soybean Oil Manfrs. Assoc., pp. 720-721; use of soybean oil, p. 723; and the detection of soybean oil, p. 774.

The Oil Index Supplement contains, pp. A1380-A1381, a list of commercial soybean oils with the names of the producers, and certain information about the oils supplied by the producers themselves.

670. Gardner, Henry A. The practical testing of drying and semi-drying paint oils. Amer. Soc. for Testing Materials Proc., 11: 641-649. [n.p.], 1911. 290.9 An34

Proceedings of the Fourteenth annual meeting held at Atlantic City, New Jersey, June 27-July 1, 1911.

Describes the method of conducting the paint tests at Washington, D. C., which were conducted by the Institute of Industrial Research, at the request of the Paint Manufacturers' Association of the United States. Soybean oil was one of the vehicles used.

671. Gardner, Henry A. Repainting tests on paint oils. With notes on the changes occurring in oils upon ageing. Paint Manfrs. Assoc. U. S., Ed. Bur., Bull. 46, pp. 112-121. Philadelphia, Pa. [cop. 1914.] 306.9 P162

Reprint of Circular 30 of the Scientific Section.

Gives the conclusions obtained in paint tests at Washington, D. C., in May 1911. Soybean oil paint was included.

672. Gardner, Henry A. Research in the paint industry. Sci. Amer. 122(4): 89. Jan. 24, 1920. 470 Sci25  
The tests made in substituting soybean oil for linseed oil are described, and it is concluded that "soya oil is a highly desirable paint oil when intelligently handled by the paint manufacturers."
673. Halliday, G. E., and Kraybill, H. R. Method for measuring color of soybean oil. Oil and Soap 12(2): 22-24. February 1935. 307.8 J82  
"A paper presented at the eighth fall meeting of the American Oil Chemists' Society in Chicago, October 11, 1934."  
"Part of these data are from a thesis submitted by G. E. Halliday to the Faculty of the Graduate School of Purdue University in partial fulfillment of the requirements for the degree of Master of Science, August, 1934."  
Literature cited, p. 24.  
"On the basis of these data [which have been outlined] a colorimetric method of determining the color number of soybean oil was devised which is simple, rapid and accurate..."
674. Hauge, S. M., Wilbur, J. W., and Hilton, J. H. An attempt to remove the vitamin A suppressing factor in soybean oil by adsorbents. Jour. Dairy Sci. 20(7): 429. July 1937. 44.8 J822  
Abstract of paper presented at annual meeting of the American Dairy Science Association.  
"The results of this preliminary trial would indicate that activated carbon removed a good portion of the vitamin A suppressing factor in soybean oil, while the other adsorbent [synthetic sodium aluminum silicate] was without effect."
675. Heberer, A. J. Some uses of soybean oil in paints and varnishes. Oil & Soap 14(1): 15-16. January 1937. 307.8 J82  
"A paper presented at the Fall Meeting of the A.O.C.S. [American Oil Chemists' Society], Chicago, October 8-9, 1936."  
"Soya oil has been used in the paint industry for about 40 years and one can readily foresee that although Soya oil is not a substitute for linseed it has certain properties which make it necessary to the paint industry, and who knows but that with 3000 years' experience and development Soya oil may supersede linseed in the paint and varnish industry."
676. Heckel, G. B. Fire hazard of the newer "drying" oils. Natl. Fire Protection Assoc. Quart. 12(3): 283-284. January 1919. 296.68 N212  
Soy, perilla, tung, fish or menhaden oils are "as to their status as 'risks', on the same footing as linseed oil."
677. Heller, Hans. Soybean oil. Farbe und Lack 1937, pp. 161-162, 175.  
Not examined.  
"This discussion of soybean oil is devoted mainly to correcting several widely accepted inaccuracies relating to its production,



properties and uses. Refined soybean oil is, when blown, especially suitable for printing ink and with Beckacites yields excellent baking enamels." - Chem. Abs. 31(20): 7673. Oct. 20, 1937.

678. Hirose, Masawa, and Shimomura, Tsuneo. Study on polymerised soja bean oil and its soap. Soc. Chem. Indus. Japan Jour. 33(5): 169B-172B. May 1930. J385 J82  
This is an English abstract in the Supplementary binding of an original article in Japanese in the main binding.  
"As will be seen from these experiments polymerisation gives somewhat bad influence on the detergent power, but the appearance and the quality of the soap do not grow worse during preservation by the action of air. Moreover, polymerisation increases remarkably the tenacity of soap..."
679. Horvath, A. A. Adhesives from soya protein. Indus. and Engin. Chem., News Ed. 14(24): 500. Dec. 20, 1936. 381 J825  
Methods for extracting soybean oil from the beans by means of benzine and the extraction of the protein from the meal by alkalies as given in patents 1,275,308 (U. S. 1918) and 1,321,480 (U. S. 1919) by S. Satow. The protein may be used in the manufacture of adhesives.
680. Horvath, A. A. Soybean oil as soap making material. Assoc. Chinese Amer. Engin. Jour. 6(7): 65-72. July 1925. Libr. Cong. TA4.A87  
Soybean oil as a substitute for linseed or cottonseed oil in soap making. Methods of making the various soaps from soybean oil and their characteristics are described.
681. Horvath, A. A. Soybean oil for soap making. Soc. Chem. Indus. Jour. (Chem. and Indus.) 55(36): 691-693. Sept. 4, 1936. 382 M31  
"Based on experimental work conducted by the author in 1920-21 at the laboratories of the Tientsin Chemical Works Association, Tientsin, China."  
Bibliography, p. 693.  
"(1) The lathering capacity of soybean oil soap is not much affected by the hardness of the water. (2) The caustic soda lye used in the initial saponification step of soybean oil should not exceed 8.5° Bé. (3) For curd soaps soybean oil should be used only in mixtures with other fats and oils. (4) Soybean oil is very suitable for the manufacture of soft soap. (5) The hydrolysis of soybean oil by Twitchell reagent and the manufacture of soap from the fatty acids are discussed." - Summary, p. 693.  
Abstract in "The utilization of soya beans." Chem. Age London 34(880): 417-418. May 9, 1936. 382 C427
682. How soya bean oil has entered the field of major oil crops. Chemicals 34(25): 3-4. Dec. 22, 1930. 306.8 C42  
"The sales of a million gallons of soya bean oil during the past two weeks to manufacturers of soap and to edible oil refiners by

one of the largest crushers in this country emphasizes the change that has come about in this industry during the past few years."

683. Iowa. State planning board. An approach to county planning, Appanoose County. 109pp., illus. [Des Moines] Iowa state planning board, 1936. 280.7 Io9A

Soybean products, pp. 29-30. A short statement about a new industry in Centerville - Standard Soybean Mills which, at that time, was operating at only about one-half capacity, because of high prices of beans.

684. Iwasa, Yosaburo. [Utilization of the by-products in the preparation of soybean oil by the alcohol-extraction method.] Agr. Chem. Soc. Japan Jour. 13(3): 225-235. March 1937. J385 Ag8

Text in Japanese.

Abstract by Y. Kihara in Chem. Abs. 31(15): 5607. Aug. 10, 1937. 381 Am33C

685. Kakimoto, Yoshihide. Preparation of reclaimed rubber with soy-bean oil. Osaka Indus. Research Inst. Japan. Repts. 19, No. 9. 1929. Not examined.

"The method of prepg. reclaimed rubber with soy-bean oil under various conditions was studied. The material was prepd. by vulcanizing F.A.Q. smoked sheet with acid-free S(90:10 ratio) under proper conditions. Reclaimed rubber was prepd. by the usual method, i.e., by mixing the vulcanizate with soy-bean oil. The mixt. of vulcanizate and oil was vulcanized with S(60:30:10 ratio) under various conditions..." - Chem. Abs. 24: 988. January-April 1930.

686. Keghel, Maurice de. Les "stand olie" et autres huiles préparées dans leurs applications aux peintures émail & peintures vernissées. La Revue des Produits Chimiques 25(18): 613-618; (22): 757-764; (24): 829, 831-838. Sept. 30, Nov. 30, Dec. 31, 1922. 383 R327 folio

This study on prepared oils as used in enamels and varnishes. contains a brief passage on the use of perilla and soybean oil in the paint industry, p. 763. The treatment of soybean oil to render it usable is outlined.

687. Kemner, H. [Perilla oil and soybean oil [in the paint industry].] Farbe und Lack 1937, pp. 595-596. Not examined.

688. Ladd, Culver. Soya bean investigation. N. Dak. Agr. Expt. Sta., Food Dept., Paint Bull. 1(7): 130-138. October 1919.

"At the request of the Paint Manufacturers Association the chemical department carried on an investigation with soya beans grown by the Paint Manufacturers Association..."



"The object of the investigation was to determine what varieties were best suited to the various growing conditions and to obtain at the same time an oil suitable for use in the paint industry. The need for such an investigation was the demand for a suitable substitute for linseed oil which is becoming scarce with its rapidly increasing use."

Results are given in tabular form.

689. Lahey, W. G. Fish oil and soya bean oil as paint and varnish vehicles. *Drugs, Oils and Paints* 35(5): 183-187. October 1919. Libr. Cong. TPl.D7

Paper read before the Paint and Varnish Production Men's Club of St. Louis.

"I have attempted to give you the results obtained by authorities, and such information as I have picked up in contact with manufacturers to justify the use of fish and soya oils in paint and varnish."

690. Laucks, I. F. Commercial oils, vegetable and animal, with special reference to Oriental oils. 138pp. New York, John Wiley & sons, inc.; London, Chapman & Hall, ltd., 1919. 307 L36

Section on Soya Bean Oil, pp. 42-46, describes the composition of the soybean and the uses of the oil, and quotes the grades for soybean oil suggested by the New York Produce Exchange, April 15, 1918, and the rules for soybean oil formulated by the Interstate Cottonseed Crushers Association.

691. Lewis, A. J., and Markley, K. S. Soybean oil varnishes. *Paint, Oil, and Chem. Rev.* 99(26): 5. Dec. 23, 1937. 306.8 Pl6

"The examples cited above are typical of the results which have been obtained in the paint and varnish research of the U. S. Regional Soybean Industrial Products Laboratory. The work, much of which is still in progress, indicates clearly that properly-treated soybean oil can be substituted up to 100 per cent of the oil vehicle in a considerable number of varnishes, not only without impairment, but in certain cases with actual improvement of the properties of the resulting films."

692. Long, J. S., Reynolds, J. B., and Napravnik, Joseph. Studies in the drying oils. XVIII. Specific heat and features of heating drying oils. *Indus. and Engin. Chem.* 26(8): 864-868. August 1934. 381 J825

"Presented before the Division of Paint and Varnish Chemistry at the 87th Meeting of the American Chemical Society, St. Petersburg, Fla., March 25 to 30, 1934."

"The specific heats of linseed oil, China wood oil, and soybean oil have been determined over much of the temperature range employed in heating them to make industrial products..." - Note.

693. Mazzetti, Giuseppe. Ulteriori osservazioni sul potere battericida dell'olio di lino cotto e di altri olii vegetali. Società Italiana di Biologia Sperimentale. Bollettino 3(6): 754-758. Nov. 20, 1928. 442.8 Sol2

This is the third in a series of articles on the bactericidal power of boiled linseed oil and other vegetable oils. Very brief results for soybean oil are included in this installment.

694. [Morrison, H. J.] Report of Soya bean oil committee. Cotton Oil Press 4(3): 90-92. July 1920. 307.8 C8234

"At the meeting of the Soya Bean Oil Committee of the Society of Cotton Product Analysts held in the arbitration room of the New York Produce Exchange on December 10, the rules governing transactions in soya bean oil were discussed..." Results of cooperative color readings of two oil samples sent out by the Soya Bean Oil Committee are given in tabular form.

695. Nelson, E. M. Chemical study of the ether extracts of soy bean leaves. Jour. Indus. and Engin. Chem. 12(1): 49-50. January 1920. 381 J825

"Published with the approval of the Director of the Wisconsin Agricultural Experiment Station."

Describes the results of an experiment to determine whether soybean leaves form an available source of oil for paint manufacture.

696. Nemzek, L. P. The production and use of soya bean oil in the United States with a brief history of their development. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec. Circ. 155, 14pp. [n.p.] September 1922. 306.9 P162C

Reprinted in Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec. Proc. 1923: 1-14. "National Varnish Manufacturers' Association (Co-operating)". 306.9 P162P

An address before the Corn Belt Seed Growers' Association, Columbia, Mo., September 1, 1922.

Importance and value of soybean oil, the imports of it into the United States 1913-1921, the tests made to establish its adaptability to paint and varnish making, methods of manufacturing soybean oil, the physical properties of and prices obtained for the oil, price of beans, and the composition of the meal are fully discussed.

Also published under title: Soya bean oil: production and uses. Oil, Paint and Drug Reporter 102(20): 33, 50. Nov. 6, 1922. 306.8 Oi5

Also under title: Production and use of soya bean oil in U. S. A brief history of its development in the United States. Properties of the oil and its by-products. Paint, Oil and Chem. Rev. 74(9): 10-11; (10): 10-11. Aug. 30-Sept. 6, 1922. 306.8 P16



697. Nemzek, L. P. The soya bean and soya oil. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec., Circ. 37, [8]pp. [n.p.] June 10, 1916.  
306.9 P162C  
Address presented at meeting of the Mississippi Cotton Seed Crushers' Association, New Orleans, La., May 18, 1916.  
The work done by the Educational Bureau of the Paint Manufacturers' Association in the interest of soybean oil is outlined and there are discussed the quality of the oil produced in this country, prices at which soybeans should be purchased for profit in the oil industry, and opportunities for disposing of the oil and meal.
698. A new use for soy beans. Hoard's Dairyman 51(3): 94. Feb. 11, 1916.  
44.8 H65  
Describes the work of the Elizabeth City, North Carolina oil mill, the quantity of soybeans handled, and the uses to which the meal may be put.
699. North Carolina State college of agriculture and engineering, State College Station, Raleigh. The commercial use of the soybean. N. C. Agr. Col. Ext. Circ. 29, 16pp. Raleigh and West Raleigh, 1916.  
This circular is made up of extracts from letters to C. B. Williams of manufacturers using soybean oil. "Observations from extracts of letters," p. 16, has the statement that "it is quite evident that soybean oil has wide usefulness in the manufacture of soap, paint, varnish, enamel, japans, linoleums, oilcloth and other waterproofing materials, asphaltum, salad oils and other human foods, etc."
700. Paint company erects new soy oil plant. Bur. Farmer (Ill. Agr. Sec.) 10(8): 8. April 1935. 280.82 B89  
The article describes the growing interest in soybeans, the erection of a new \$650,000 plant for processing soybeans by the Glidden Company in Chicago, and the value of soybean oil in paint.
701. Paint manufacturers' association of the United States, Educational bureau, Scientific section. Inspection report on Washington paint oil tests and Washington cement paint tests. Paint Manfrs. Assoc. U. S., Ed. Bur., Sci. Sec. Bull. 53, 40pp. Philadelphia, February 1917. 306.9 P162  
Preface by Henry A. Gardner.  
Observations in tabular form on the exposures made at The Institute of Industrial Research, Washington, D. C. Soybean oil paints are included.
702. Pontius, Albert W. Soap from soya beans. U. S. Dept. Com. Bur. Manfr. Daily Cons. and Trade Repts. 15(107): 494. Washington, D. C., May 6, 1912. 157.7 C76D  
This is a report on the Manchurian soap industry. A note

appended by the Bureau of Manufactures cites the value of the soybeans imported by American soap factories in 1911.

Also contained in article entitled "Soap from Soya Bean Oil." Oil and Colour Trades Jour. 41(712): 1985. June 8, 1912. 306.8 0152

The latter is given in an abstract in Chemiker Zeitung, Reportorium 37(60-62): 285. May 24, 1913. 384 0427.

703. Price, David J., and Brown, Hylton R. Glidden soybean plant explosion. Natl. Fire Protection Assoc. Quart. 29(3): 233-240. January 1936. 296.68 N212

A study of the cause of the explosion of the soybean processing plant of the Glidden Company in Chicago. The conclusions from the investigation and recommendations are given.

This report has been adapted in an article by the authors under the title "Explosions Reveal Hazards of Soybean Processing" in Natl. Safety News 33(3): 19-21. March 1936. 449.8 N212

704. Price, David J. A rural soybean plant explosion. Natl. Fire Protection Assoc. Quart. 29(3): 240-243. January 1936. 296.68 N212

A report on the explosion of a soybean extraction plant at Momence, Illinois. Recommendations are made.

Report adapted in Natl. Safety News 33(3): 21, 68. March 1936. 449.8 N212

705. [Price, David J.] Soy bean explosion hazards. Safety Engin. 75(3): 20. March 1938. 449.8 Sal

"Safety measures and devices for reducing the danger of explosions should be included in plans for building soy bean oil-extracting plants. Vapors produced in using hexane and similar flammable solvents in extracting oil from soy beans may be easily ignited and cause disastrous explosions according to Dr. D. J. Price, of the U. S. Dept. of Agriculture."

706. The production and industrial employment of vegetable oils. Engineer 123(3189): 123-124; (3190): 147-148; (3191): 169-172; (3192): 192-194; (3193): 213-215; (3194): 240-242; (3195): 261-263; (3197): 307-308; (3199): 349-352; (3201): 395-399; (3202): 417-418; (3203): 439-440; (3204): 462-463; (3205): 486-488; (3206): 511-514; (3207): 546-548; (3208): 559-561; (3209): 581-584. Feb. 9-March 23, April 6, April 20, May 4-June 29, 1917. Libr. Cong. TA1.E5

Describes the production of vegetable oils from a mechanical point of view with much detail on processes of extraction and refining of oils. The second installment, which lists the principal vegetable oils and summarizes their sources, characteristics and chief uses, includes soybean oil. Numerous illustrations and diagrams are given for the machinery and processes used.



707. Regional soybean products laboratory reports on varnish exposure tests.  
Amer. Paint Jour. 22: 7-8. Jan. 3, 1938.  
Not examined.  
"...It has been found that soybean oil can be substituted up to 100% for the oil constituent in many varnishes without impairing them. A soybean oil varnish subjected to 7 months weathering is still in good condition, shows little luster loss and no checking, peeling or cracking." - Chem. Abs. 32(5): 1951. Mar. 10, 1938.
708. Roquemore, Everett E. Soybean oil meal rating as a protein supplement.  
Grain & Feed Jours. Consolidated 68(9): 464-465. May 11, 1932.  
298.8 G762  
Methods of extracting soybean oil, chemical analysis of the oil meal, the use of the meal in animal feeding, and results in its use by various experiment stations, and soybean production and demand in the United States, are considered.
709. Sefing, F. G., and Surls, M. F. The use of soy bean oil as a core binder. Mich. Engin. Expt. Sta. Bull. 54, 12pp. East Lansing, 1933. 290.9 M583  
Bibliography, p. 10.  
"Soy bean oil was suggested for investigation as a cheap oil which might be used to advantage by the foundry and at the same time provide an outlet for the oil which is a by-product of the soy bean cake industry. The investigation was, therefore, undertaken for the purpose of determining the suitability of raw bean oil as a core binder for foundry work."
710. Shimo, Kotaro, and Harada, Taro. Fermentation of soybean meal. Soc. Chem. Indus. Japan Jour. 32(2): 125-130. February 1929. J385 J82  
Article in Japanese.  
Abstract in English and English title in supplementary binding, pp. 40B-42B.  
A study of the constituents of soybean meal before and after fermentation. It has been found more profitable to ferment the meal when used as fertilizer for certain plants.
711. Smith, R. L., and Kraybill, H. R. Soy-bean oil. Quality and yield as affected by conditions of expression. Indus. and Engin. Chem. 25(8): 334-336. March 1933. 381 J825  
"Literature cited", p. 336.  
The authors list the commercial uses for soybean oil and discuss the effect of moisture content and temperature of pressing on the quality of soybean oil.
712. Solvents a hazard in soybean oil extraction. Natl. Safety News 33(1): 54. January 1936. 449.8 N212  
"Measures for reducing the danger of explosion should be included in plans for building soybean oil extracting plants on farms

and in rural communities, says the Bureau of Chemistry and Soils of the U. S. Department of Agriculture. Vapors produced in using hexane and similar flammable solvents used in extracted oil from soybeans may be easily ignited and cause disastrous explosions."

713. Soya bean as linseed oil substitute. Chemicals 34(17): 9-10. Oct. 27, 1930. 306.8 C42

German experiments were found to show unsatisfactory results in the manufacture of varnishes. It is concluded, however, that "certain varieties of the bean, harvested under the right conditions, and milled at the right age in the right manner, will yield an oil quite suitable for varnish manufacture."

714. Soybean as an aid to the paint manufacturer. Illus. World 33: 278-279. April 1920. Libr. Cong. T1.T2  
Not seen.

715. Soybean crushing costs. Grain & Feed Jours. Consolidated 79(6): 271. Sept. 22, 1937. 298.8 G762

Soybean crushing cost is said to depend "upon the size of the plant, the cost of the building, the amount of machinery, and the system of oil extraction used."

716. Soy bean industry in Illinois. Chem. Age 30(7): 308. July 1922. 381 C423

"A. E. Staley Mfg. Co., Decatur, Ill., will establish a plant for the extraction of oil from soy beans in conjunction with its starch and glucose plant..."

"The Staley Journal says that the soy bean is a crop which can be grown to advantage on every farm in Illinois."

The demand for soybean oil and the possibilities of substituting it for other products are considered.

717. Soybean oil activities expanded by Staley co. Oil, Paint and Drug Reporter 130(16): 36. Oct. 19, 1936. 306.8 O15

"The A. E. Staley Manufacturing Company, Decatur, Ill., is the largest maker of soybean products in this country, and to A. E. Staley, its head, belongs the credit for the origin, growth and success of the soybean industry in the United States, according to an article published in the Staley Journal, a house organ issued monthly by the A. E. Staley Manufacturing Company." The part played by the company in developing the soybean industry is outlined.

718. Soybean oil standards fixed by association. Oil, Paint and Drug Reporter 118(3): 36. July 21, 1930. 306.8 O15

Lists the standards for the quality and purity of crude domestic raw soybean oil adopted by the National Soybean Oil Manufacturers



Association, as well as the trading rules adopted by it. These latter refer to quality, color, foots, impurities, off quality, quantity, price, terms, time of shipment, shipping directions, routing, weights and samples, rejection, adaptability of goods, contingencies, brokerage, arbitration, freight rates, tankcars, and unloading.

Official chemists are named.

719. Soybean oil varnish stands weather test. Oil, Paint & Drug Reporter 133(1): 3, 41. Jan. 3, 1938. 306.8 Oi5

"A new soybean oil varnish that is standing up well in weather tests was announced today by the Regional Soybean Industrial Products Laboratory of the Department of Agriculture." - [News item dated Washington, Dec. 28, 1937].

720. Soybean products are defined by association. Oil, Paint and Drug Reporter 122(21): 52. Nov. 14, 1932. 306.8 Oi5

"The following definitions have been adopted by the National Soybean Oil Manufacturers Association for by-products of crushing soybeans for the production of oil."

721. Soy beans and soy bean oil. Trop. Life 6(2): 25. February 1910. 26 T752

Chiefly a quotation from an article in the New York Oil, Paint and Drug Reporter as to whether soybean oil can be used for paint.

Also in Indian Trade Jour. 17(210): 23. April 7, 1910. Libr. Cong. HF41.I3 (as a reprint from the Oil, Paint and Drug Reporter)

722. Suzuki, K., and Yazaki, A. [Nutritive value of soya-bean cakes.] Agr. Chem. Soc. Japan Jour. 9(2, whole no. 101): 145-151. February 1933. J385 Ag8

"The cake obtained in removing the oil by pressure contains more vitamin-A than that obtained by extraction of the oil with solvents." - Brit. Chem. Abs. (Suppl. to Soc. Chem. Indus. Jour.) B: 936. Nov. 17, 1933. 382 B773

723. Swift & Company's soy bean plant at Champaign. Grain & Feed Jours. Consolidated 79(12): 540-541, 552. Dec. 22, 1937. 289.8 G762

A description of the equipment and operation of the plant, which will produce soybean oil to be used in the making of vegetable oil products, and soybean meal to be sold as livestock feed. Pictures of the plant are included.

724. Thompson, Firman, and Morgan, H. H. Soy bean oil. Del. Agr. Expt. Sta. Bull. 98[i.e.99], 13pp. Newark, 1912.

"Inasmuch as a large part of the United States seems well adapted for the growth of the soy bean, it is the object of this bulletin to inquire into the possibilities of its use as an oil seed in conjunction with its undoubted value as a nitrogen-gatherer for the soil."

725. Thone, Frank. Tung trees in America. Introduced here 30 years ago, rapid-growing trees from the Orient gain root-hold in the South. Sci. News Letter 32(849): 42-44. July 17, 1937.  
Contains a statement on pp. 43-44 on the fact that "the tung-oil of the South is expected to form a vital link with the farming-for-industry movement in the North, through another oil plant that also came from China, the soy bean." The soybean's greatest potential market is said to be its use as a paint ingredient. Used alone, soybean oil is a slow drier. The addition of the required proportion of heat-treated tung oil greatly improves "the performance of the paint."
726. Thurston, Azor. Soybean oil. Midland Druggist 52: 202-203. 1918.  
Libr. Cong. RS1.M75  
Not examined.  
"An account of the origin, properties and uses of the oil..." - S. Waldbott in Chem. Abs. 12(14): 1518. July 20, 1918.
727. Toch, Maximilian. Soya-bean oil as a substitute for linseed oil in paints. Engin. News 68(22): 1027-1028. Nov. 28, 1912. 290.8 En34  
"From a paper read before the Society of Chemical Industry, New York City, June 7, 1912."  
"It is too soon to prognosticate the value of soya-bean oil for exterior painting. But for interior use soya-bean oil is the equal in every respect of linseed oil - particularly when treated with a tungate drier." The low price of soybean oil as compared with linseed oil is cited.
728. Toch, Maximilian. Soya bean oil for paint purposes. Soc. Chem. Indus. Jour. 31(12): 572-574. June 29, 1912. 382 M31  
This paper was delivered at the meeting of the New York section of the Society for Chemical Industries at Chemists' Building on Friday, May 24, 1912.  
"It is not within the province of the writer to forecast the future of any paint oil, but there is no doubt that if a campaign of education be urged among the farmers, particularly in those states where soil has been regarded as unproductive, and the proper selected seeds of soya beans are planted, no scarcity in the flax-seed crop will ever again be a menace to the paint and varnish industries. At the time of writing linseed oil is quoted at 75 cents per gallon and soya bean oil at 55 cents per gallon. As soon as thousands of acres shall have been planted with soya beans, the proper machinery installed, and the sale for the cake and the silage arranged, soya bean oil will sell at from 25 to 35 cents per gallon, and after the ground has been productive of soya beans for some time, it will be fit for the growing of even the most difficult crops."  
A discussion follows the paper.



729. Torri, A. J. Can country elevators process soybeans? Grain & Feed Jours. Consolidated 78(5): 190. March 10, 1937. 298.8 G762  
The author describes the three systems in use in this country for processing soybeans, costs of processing, and the problems which arise in the business.
730. Trevithick, H. P. Soya bean oil refining committee of the American Oil Chemists Society, report. Cotton Oil Press 5(1): 53-54. May 1921. 307.8 C8234  
"Below will be found a table showing some readings by Dr. Wesson of the Southern Cotton Oil Co., and Mr. Cluff of the American Cotton Oil Co. on soya bean oils where readings were made by daylight and by use of the daylight lamp, Dr. Wesson using the Hess-Ives lamp and Mr. Cluff the Macbeth lamp."
731. Tucker, Mary E. Analysis of soya bean oil for refining loss. Cotton Oil Press 3(6): 41. October 1919. 307.8 C8234  
Laboratory practice and findings in refining soybean oil at Falkenburg & Co., Seattle, Washington.
732. U. S. National recovery administration. Proposed code of fair competition for the soybean products processing industry; as revised for a public hearing on December 6, 1934 (Hearing no. 686). 13pp. Washington, U. S. Govt. print. off., 1934. (Registry no. 146-09)  
"Submitted by National Soybean Oil Mfg's Association."  
The code specifies the purposes of the code; meanings of various terms in the industry; hours; wages; general labor and other provisions; organization, powers and duties of the Code Authority; price practices; trade practice rules; export trade provisions, and provisions for amendments, monopolies, price increases, licenses and marketing agreements, and effective date.
733. U. S. Tariff commission. Production and transportation costs of certain oils. Letter from the Chairman of the United States Tariff Commission transmitting in response to Senate Resolution No. 323 (Seventy-first Congress), certain information relative to the costs of production and transportation to the principal consuming markets of the United States of certain oils and the principal uses thereof. 240pp. Washington, U. S. Govt. print. off., 1932. (Report no. 41, 2d ser.) 173 T17Rs  
Cover title: Report to the Congress on certain vegetable oils, whale oil, and copra.  
"Interpreting the resolution as outlined, this investigation has been conducted for the purpose of ascertaining the uses of the commodities mentioned and their interchangeability with domestic oils made from domestic materials, so far as such facts may be determined from a study of the technical properties of the oils concerned, their costs, prices, and other economic factors."

Part IV, pp. 119-176, Statistical and Technical Information on Interchangeability of Vegetable and Animal Oils, has the following passages on soybeans: the technical position of soybean oil in soap making, p. 147; soybean oil in the margarine industry, p. 157; soybean oil in the lard-compound industry, p. 163; in the salad oils and dressing industry, p. 166.

Part V, Economic Factors Affecting Interchangeability of Oils - The Question of Replacement, pp. 177-240. This contains sections on price comparisons of soybean, cottonseed and corn oil, pp. 227-228; supply and demand conditions for soybean oil, pp. 231-233; feeding and fertilizing value of cake and meal, and imports of meal (tables), pp. 234-236; and economic factors affecting the interchange of rapeseed oil with domestic corn and soybean oils, pp. 239-240.

The study contains numerous statistical tables, some of which relate to soybeans.

734. Vlachos, William, and Vlachos, C. A. Fire and explosion hazards of commercial oils. 292pp. [Philadelphia] Vlachos & co., 1921.  
Libr. Cong. HG9731.O5V5  
Soy bean oil, pp. 39-40.

735. Ware, E. E. Soybean oil and the paint industry. Indus. and Engin. Chem. 28(8): 903-906. August 1936. 381 J825  
"Symposium on the Chemistry and Technology of Soybeans, Presented before the Division of Agricultural and Food Chemistry at the 91st Meeting of the American Chemical Society, Kansas City, Mo., April 13 to 17, 1936."  
"Soybean oil is not ideal for paint use because of poor drying qualities, but it does possess the excellent characteristics of permanent elasticity and freedom from discoloration. At present it is seldom used alone; it is either blended with oils of better drying qualities or as a constituent of a synthetic resin vehicle.  
"The utilization of soybean oil in paints and varnishes will progress through pressure of popular opinion and as a result of agricultural and industrial research in the improvement of the product." - Abstract, p. 903.  
Abstract in "The utilization of soya beans". Chem. Age [London] 34(880): 417-418. May 9, 1936. 382 C427

736. Washburn, W. F. Soya bean oil. N. Dak. Agr. Expt. Sta. Bull. 118, pp. 35-42. Agricultural College, N. D., 1916.  
"At the request of the Paint Manufacturers Association this department has determined the moisture and oil content of many samples of soya beans and in addition has determined some of the constants of the oils exprest from the different samples. These samples, representing some forty-five varieties, were grown in a number of states under various climatic conditions and include the crops of 1912, 1913, and 1914."  
The results are given in tabular form.



737. Waterproof liquid from bean oil. U. S. Dept. Com. and Labor, Bur. Manfr. Daily Cons. and Trade Repts. 13(104): 448. Washington, D. C., Nov. 3, 1910. 157.7 C76D

This is a paragraph quoted by Vice-Consul A. A. Williamson from the Manchurian Daily News that "an official of the South Manchurian Railway has, by dint of application, invented a new use for soya-bean oil as material for preparing a waterproof liquid which is pronounced by the experts of the Dalny central laboratory of that line to give greater durability at a cheaper cost." It is said that this bean oil now comes into the United States free of duty.

738. Yamada, T. Removal of solid components from fatty oils and drying properties of the residual oils. I. On soya-bean oil. Soc. Chem. Indus. Japan Jour. 37(4): 431-433. April 1934. J385 J82  
Article in Japanese.

Alternate title and abstract in English in Supplementary binding, pp. 190B-192B.

"The author has obtained a good drying oil from a soya bean oil, by removing...undesirable components from it." The methods used and results obtained follow.

#### Farm Uses

739. Albrecht, William A., and Allison, W. H. Changes in composition of soybeans toward maturity as related to their use as green manure. Soil Sci. 32(4): 271-282. October 1931. 56.8 So3  
References, p. 282.

"The following study is an attempt to measure by chemical means the differences in organic composition of the tops and roots of the soybean plant, which accompany increasing maturity, in the belief that they may offer suggestions regarding the decomposition behavior of these plant parts in the soil."

740. Arceneaux, George, McKaig, Nelson, Jr., and Stokes, I. E. Studies of soybeans and other green manure crops for sugarcane plantations. Amer. Soc. Agron. Jour. 24(5): 354-363. May 1932. 4 Am34P

"Preliminary field studies on legumes were conducted at the U. S. Dept. of Agriculture's Sugar Plant Field Station near Houma, La., during 1930, for the purpose of comparing the relative green-manuring value of several leguminous plants under conditions more or less typical of the section of Louisiana where sugarcane is extensively cultivated, and determining the most advantageous method of handling the soybean green manure crop under such conditions. The results given represent a single season's work only..."

741. Ayres, W. E. Soybeans: Delta branch station. Miss. Agr. Expt. Sta. Bull. 227, 39pp. A. & M. College, 1925.

Includes, pp. 25-35, discussion of the uses of soybeans for hay, grain, soil improvement, soiling, and silage.

742. Beavers, J. C. Soybeans with corn. Breeder's Gaz. 69(22, whole no. 1801): 1160-1161. June 1, 1916. 49 B74

Increased yields per acre and increased pork production per acre are cited as some of the advantages of planting soybeans with corn.

743. Bermuda. Department of agriculture. Soy beans and cowpeas for soil improvement. Bermuda Dept. Agr. Bull. 7(4): 6-7. April 1928. 8 B45A

Soybeans and cowpeas are recommended for soil improvement and as a labor saver, and the advantages of soybeans over cowpeas are enumerated.

744. Borst, H. L., and Park, J. B. The corn and soybean combination. Ohio Agr. Expt. Sta. Bimonthly Bull. 18(2): 37-42. Wooster, March-April 1933.

"An experiment to determine the value of growing corn and soybeans together was conducted at Columbus from 1919 to 1929, inclusive. After 3 years of preliminary work, the method decided upon was to drill both the corn and the soybeans at the same time and at three rates of planting."

The paper takes up the value of the combination for silage and for grain, and the fertility value of soybeans grown with corn.

The paper is similar in material to the one by the same authors in Ohio. Agr. Expt. Sta. Bull. 513. Wooster, 1932.

745. Borst, H. L., and Park, J. B. Experiments with growing corn and soybeans in combination. Ohio Agr. Expt. Sta. Bull. 513, 26pp. Wooster, 1932.

Bibliography, p. 26.

Three experiments were conducted: 1. A comparison of soybean varieties with corn for silage; 2. Soybeans and corn planted together for silage and grain at different rates; and 3. Corn and soybeans in combination under field conditions. The value of the combination for silage and for grain production is discussed in the conclusion.

746. Briggs, George M. Should we consider soy beans. The crop is profitable where alfalfa and clover cannot be grown. Hoard's Dairyman 61(6): 219, 230-231. Feb. 25, 1921. 44.8 H65

"Make the cost of production less. If soy bean hay will lessen the cost of the feed bill plant soy beans. If soy beans will help your soil so that you can raise something else that will make your feed bill less, plant soy beans. If soy beans in with your corn is profitable as a hogging off proposition, or a lambing off deal, or a cattle filler after silo filling time, or as a silage proposition, plant soy beans..."



747. [Briggs, George M.] Soy bean jazz. Wisconsin joins the boosters of the wonder crop - by "Soy Bean" Briggs. Country Gent. 85(30): 5, 28. July 24, 1920. 6 C833  
Importance of the soybean crop in light-soil farming.
748. Brown, H. P. Effect of soybeans on corn yields. La. Agr. Expt. Sta. Bull. 265, 31pp. Baton Rouge, 1935.  
"Literature cited", p. 31.  
"The object of the research outlined in this bulletin was to get information on the effect of soybeans on corn production in central and southern Louisiana when the two are planted in the same row at the same time; when planted in alternate rows and in the same row; when various rates of bean seeding are used; and on the value of the soybean as a soil renovater when plowed under or taken off for hay."
749. Brown, P. E. Growing soy beans not desirable on land subject to erosion or blowing. Bur. Farmer (Iowa Farm Bur. Messenger) 10(2): 21. October 1934. 280.82 B89  
"A study is to be made of this subject at the College in the near future." - Ed. Note.  
It has been found that "the crop tends to make the surface soil more open and porous and, therefore, more easily eroded."
750. Brown, P. E. Soy beans not a soil-building crop. Bur. Farmer (Iowa Farm Bur. Messenger) 10(3): 20. November 1934. 280.82 B89  
"It may be stated in conclusion that soy beans are a valuable crop in Iowa on land which is not subject to erosion or blowing but they cannot be considered a soil-building crop except when plowed under as a green manure."
751. Burger, A. A. Is the soybean here to stay? Successful Farming 26(4): 18, 53. April 1928. 6 S42  
The author recounts the results obtained on various farms in soybean growing. Its value to the soil and for feeding is brought out.
752. Burkholder, C. L. Soybean flour. Hoosier Hort. 19(5): 70-71. May 1937. 81 In2H  
"In 1936 soybean flour was used as a sticker for lead arsenate in several of the Horticultural Department plots at Lafayette and resulted in an increase in the amount of lead arsenate per pound of fruit immediately following the last cover spray and again at harvest as compared to lime and lead or lime-lead and several other types of stickers..."
753. Burlison, W. L., and Flint, W. P. Fight the chinch-bug with crops. Ill. Agr. Expt. Sta. Circ. 268, 15pp. Urbana, 1923.  
"This circular is a revision of Extension Circular 30 published in February, 1919."

The circular gives information on crops upon which chinch-bugs will not feed. Soybeans, pp. 3-8, includes sections on the uses of the beans, and methods of harvesting and threshing them.

754. Burnett, L. C. Soybeans on cornbelt farms. A crop with many uses and how to grow it. Successful Farming 21(2): 11, 32, 33. February 1922. 6 Sul2

"In the readjustment of crop acreage which will be made this season on a large number of farms, soybeans will be found of great value. They will help to solve the problem incident to rearranging crops so as to provide for more acres of legumes and fewer acres of corn. While soybeans have demonstrated their right to a place on cornbelt farms under normal conditions, the crop is worthy of more than ordinary consideration under the situation which exists this year."

755. Butler, Eugene. Strong and weak points of soy beans and cowpeas. Prog. Farmer (Miss. Valley ed.) 36(17): 468. April 23, 1921. 6 So31

The greater production of grain by soybeans, their use for late planting, and adaptability to clay or loam soils are brought out. The greatest advantage of cowpeas over soybeans is said to be the certainty with which a good stand may be obtained with them.

756. Cardwell, G. A. Why not soybeans? Farming 23(1): 8-9. April 1925. 6 F2298

Merits of the soybean in the cropping system, its superiority over the cowpea, varieties for good production, and experiences of several producers with soybeans are brought out. The writer concludes that "there is a place for soybeans on every farm."

757. Cates, J. Sidney. Victory for the soys. The experimental crop of a few years ago has become a staple. Country Gent. 84(33): 10, 40-41. Aug. 16, 1919. 6 C833

It is pointed out, among other things, that soybeans are a good poor-land crop, and that they are a good and cheap substitute for expensive manure.

758. Chambliss, Charles E. Soy-bean rotation increases rice yields greatly. U. S. Dept. Agr. Yearbook, 1926: 673-675. Washington, D. C., 1927. 1 Ag34Y

"Experiments conducted for a period of 14 years at the rice experiment station, Crowley, La., show that weeds can be controlled and may be eradicated by growing rice in rotation with soy beans."

759. Chinch bugs no longer a "bug-a-boo." Orange Judd Farmer 71(9): 267. May 1, 1923. 6 Orl

"Chinch bugs are not the 'bug-a-boo' that they once were to farmers in Macoupin County, Illinois. Even though the trouble still has to be guarded against, the development of interest in



growing soy beans along with corn in that section of the state has lessened their losses considerably in the last two years or so."

760. Churchill, F. G. The soy bean, an annual legume. Iowa Agr. Col. Ext. Bull. 68, 8pp. Ames, 1919.

Soy beans for hay, pp. 6-7, has a table showing yield of seed and hay of certain varieties of soybeans and mentions the value of the hay. Soy beans for seed, pp. 7-8, mentions yield and prices of seed. A brief paragraph, p. 8, points out the importance of the crop for soil improvement.

761. Clark, Charles W. Food, feed and cotton. Country Gent. 93(2): 109. February 1928. 6 C833

The place of soybean growing in the Cotton Belt, as a step in bringing about diversified farming.

762. Class, Charles F. Soy beans as a farm crop. Hoard's Dairyman 53(19): 789, 808. June 1, 1917. 44.8 H65

The writer suggests profitable uses on the farm for soybeans, and methods of harvesting, grinding and feeding them.

763. Cobb, C. W. A soy-bean enthusiast. Natl. Stockman and Farmer 45(3): 84-85. April 16, 1921. 6 N21

The results obtained in planting soybeans on thin land and their feed value are brought out.

764. Colter, C. E. Soybeans win favor on farm. Purdue Agr. 25(9): 183, 196. June 1931. 6 P97

"The soybean has many advantages which account for this rapid rise in favor. It can be used to improve almost any soil because of its adaptability to a wide range of soil types. Of all the grains the soybean produces the richest protein seed and the richest nitrogenous roughage, both of which are very palatable to all kinds of livestock. Its value as a catch crop is high. It ranks well as a cash crop and fits nicely into the rotation."

765. Deal, T. M. As we farm in Ioway. Natl. Stockman and Farmer 44(10): 325. June 5, 1920. 6 N21

The writer disagrees with the statement made by L. W. Lighty in his letter entitled "Soy Beans in the Corn for Silage" in this magazine for May 15, 1920, p. 239. Mr. Lighty felt that planting soybeans in corn is only good in theory. The present writer sets forth the advantages of the practice.

766. Deatricks, E. P. Reduction of soil nitrates during the growth of soybeans. Amer. Soc. Agron. Jour. 20(9): 947-958. September 1928. 4 Am34P

"Contribution from the Department of Soils, West Virginia Agricultural Experiment Station, Morgantown, W. Va. Approved as Scientific Paper No. 59..."

Literature cited, p. 958.

"Experiments with potted soils are described and data are given to show that the nitrates under maturing soybeans are very low..." - Summary, p. 957.

767. Dodd, D. R., and Pohlman, G. G. Some factors affecting the influence of soybeans, oats, and other crops on the succeeding crop. W. Va. Agr. Expt. Sta. Bull. 265, 23pp. Morgantown, 1935.

Literature cited, pp. 20-21.

"Since soybeans more commonly take the place of oats in the rotation, three experiments were conducted to compare the effects of these two crops on the soil following their removal and on the yield of the succeeding crop."

768. Drake, J. A. Management of sandy-land farms in northern Indiana and southern Michigan. U. S. Dept. Agr. Farmers' Bull. 716, 29pp. Washington, D. C., June 9, 1916. 1 Ag84F

It is stated that "the growing of soy beans and cowpeas for seed offers a definite approach to the entire problem of farm improvement in these sandy-land areas of the section." It is given as the first step in producing a well-balanced farm system from these lands.

769. Duley, F. L. Soil erosion of soybean land. Amer. Soc. Agron. Jour. 17(12): 800-803. December 1925. 4 Am34P

"If soybeans are to be a real soil building crop from the standpoint of nitrogen maintenance, they must not only replace, by means of their nitrogen-gathering power, the nitrogen removed from the land by the crop, but also the nitrogen lost in the eroded soil. During the last two years this loss of soil has been measured in connection with a soil erosion project at the Missouri experiment station. The work is being continued and this paper is presented as a progress report." - p. 800.

"The earlier results of this work were published by F. L. Duley and M. F. Miller in Mo. Agr. Expt. Sta. Research Bull. 63. 1923." - Note.

770. Etheridge, W. C., and Helm, C. A. Corn and soybeans. Mo. Agr. Expt. Sta. Bull. 220, 23pp. Columbia, 1924:

"In this bulletin the results of seven years of investigation of the corn-soybean combination are reported. The comparative feeding value of corn and soybeans and of corn alone, for fattening hogs, is shown in the summary of a five-year test. Yields of forage for sheep or cattle, produced by soybeans in corn are recorded. The relation of the mixed crop to drought, chinch bugs and soil fertility is discussed..." - Abstract, p. 3.



771. Farver, Warner E. Soy beans no harm to corn. Natl. Stockman and Farmer 42(3): 72. Apr. 13, 1918. 6 N21  
The writer finds that planting soybeans in corn did not injure the corn.
772. Finch, F. R. Experience with soybeans. Ohio Farmer 146(3, whole no. 3775): 57. July 17, 1920. 6 Oh3  
The writer found it very profitable to have a few acres of soybeans joining his corn, or growing with the corn.
773. Fox, Kirk. Don't overlook the soybeans. Dairy Farmer 21(9): 18. May 1, 1923. 44.8 K56  
"Summing up the main reasons then why soybeans are so popular, it can be said that they furnish a cheap, home-grown protein and at the same time are soil builders."
774. Freehoff, W. A. Putting protein into silage. Soy beans make it better. Orange Judd Farmer 68(15): 718, 745. Apr. 10, 1920. 6 Or1  
The author notes in part the experience of Mr. C. S. Ristow, who developed his farm from a run-down condition into one of the most profitable in Wisconsin, through a system of legume cropping and livestock farming. Planting and harvesting the crop for hay and seed are also briefly touched upon.
775. Fremery, F. de. Mededeelingen uit de praktijk. No. 1. Soja en katoen als voorvrucht. Mededeelingen van het Deli Proefstation te Medan 7(1): 57-58. July 1912. 109.5 D37  
The paper takes up the results of experiments with soybeans and cotton as a preparatory crop for tobacco.
776. Gapen, C. E. Speaking of soybeans. Successful Farming 19(12): 24, 34, 48, 49, 74. December 1920. 6 Sul2  
"The soybean showed its value as a feed, a soil improver and as a dependable unit in the rotation before the gates of the fields were thrown open to it. Much of the foundation for the popularity of this Americanized alien has been built by progressive farmers in Illinois and Indiana..." The experience of William E. Riegel of the Charles Meharry farm in Champaign county, Illinois, with the crop is cited.
777. Graber, L. F. A corn and soy bean partnership. Hoard's Dairyman 59(9): 527, 587. March 19, 1920. 44.8 H65  
"Many are thinking about the soy bean and a few are trying to forget it. But after all is said and done - after all the successes and failures have been put in the balance, there will be a preponderance of evidence in favor of the soy bean as an 'emergency' crop and as a 'companion' crop."

778. Harper, Woods. It's not too late to plant soys. The South needs them to feed men, animals and the soil. Country Gent. 82(22): 957. June 2, 1917. 6 C833

"Of all the crops susceptible of eleventh-hour planting in the South, none holds out more promise of reward, none more closely fills the order for an emergency crop to meet a food crisis than the soy bean."

779. Holm, C. A. Soybean varieties for seed and for hay. Mo. Agr. Col. Ext. Leaflet 25, 3pp. Columbia, 1928.

Suggests varieties for seed on good land and medium to poor land, and varieties for hay.

780. Helper, George Y. Soy beans have many virtues. Orange Judd Farmer 62(13): 19. Mar. 31, 1917. 6 Orl

The varieties to be used for hay and seed are mentioned, and it is pointed out that by planting soybeans the soil was so improved that clover could be grown where before it was impossible.

781. Hodgson, R. E. Soybeans; their use and culture in southern Minnesota. Minn. Agr. Col. Ext. Div. Spec. Bull. 82, 8pp. University Farm, St. Paul, 1924.

Soybeans as hay, for hogs, and for seed, the feeding of soybean straw, and varieties suited to Minnesota, are among the topics discussed.

782. Huff, S. W. Soy beans with corn. Country Gent. 82(24): 1021. June 16, 1917. 6 C833

The writer describes the methods used by him in growing soybeans in the same row with corn at Wildwood farms, near Richmond, Va. His estimation of the savings caused by the experiment was "at least \$1000 worth of additional leguminous feed without any additional expense of cultivation and with very little additional expense of handling, and with an expenditure of less than fifty dollars for seed."

783. Hughes, H. D., and Wilkins, F. S. Soybeans. Iowa Agr. Expt. Sta. Circ. 84, 15pp. Ames, 1923.

"In Iowa soybeans have more uses than any other legume. They may be grown either alone or in combination with corn. The seed is one-third protein and contains two important vitamins, making it a high grade, home grown supplemental feed for any kind of livestock. The soybean plant is as high in feeding value as alfalfa and may be used in the form of hay, pasture, silage or soilage, or as a protein concentrate..."

"The many uses of the crop on Iowa farms, the ease and certainty with which it may be grown and the profits derived from its production account for the fact that the soybean acreage in Iowa is more than doubling each year."



784. Hughes, H. D., and Wilkins, F. S. Soybeans for Iowa. Iowa Agr. Expt. Sta. Bull. 228, pp. 347-405. Ames, 1925.  
This bulletin deals chiefly with cultural practices, but has, p. 347, a section on the uses of the soybean in Iowa, where it is said to have more uses than any other legume. Tables on pp. 404-405, compare the yield of soybeans with that of cowpeas and field beans.
785. Ingalls, W. F. Soy beans. 36pp. [Cooperstown, N. Y., The Arthur H. Crist Co., 1912.] 77 In4  
Advantages of raising soy beans with corn, pp. 27-31.
786. Jenkins, E. H. Soy beans. Conn. Agr. Expt. Sta. Bull. 179, 13pp. New Haven, 1913.  
"This bulletin gives some facts about the crop and the uses which farmers may make of it, in the belief that it has a place among paying crops and should at least be tested carefully in Connecticut." - p. 3.
787. Jordan, George F. Try soy beans for pasture. Va. Dept. Agr. and Immigr. Year Book, 1920: 42-44. Richmond, Davis Botton, Sup't of public printing, 1920. (Bulletin 148)  
"In talking of pasture for both sheep and hogs, the writer is not attempting to boost directly either of these lines of farming. What he wants to show is that the soy bean is one of the best crops that can be grown in the sheep raising sections of the western part of the State, and yields very little to other crops in its adaptability to all sections where the hog finds a home...  
"In addition, soy beans are nitrogen gatherers. The stock on pasture become harvesters, hay balers and manure spreaders combined, with the soy bean crop marketed on four feet, - and at what has never yet failed, - marketed at a premium of considerable size over the old style method of running these two classes of stock on the usual summer pasture rations."
788. Jordan, Sam. The onward march of soys. Long is the list of this crop's sturdy virtues. Country Gent. 87(26): 5. Aug. 5, 1922. 6 C842  
Advantages of growing soybeans in the Corn Belt are brought out.
789. Justice, J. L. Grow soy beans with corn. Orange Judd Farmer 60(20): 2. May 13, 1916. 6 Orl  
The author believes it is more advantageous to grow soybeans with the corn for silage or hogging down, rather than separately.
790. Keith, B. W. Soy beans as a soil improver. Rural New Yorker 84(4842): 623. April 11, 1925. 6 R88  
"Here is a crop which will improve the productiveness of your soil by adding as much nitrogen per acre as 10 big loads of good

barnyard manure, thus making it possible to grow larger and better crops the following season."

791. Kenyon, E. T. . Soybeans for soil improvement. Ohio Farmer 143(16, whole no. 3710): 631. Apr. 19, 1919. 6 Oh3  
"For land upbuilding, ease of handling and as feed I have found nothing as good as the soybean."
792. Kinney, E. J., and Roberts, George. Soybeans. Ky. Agr. Expt. Sta. Bull. 232, pp. 23-57. Lexington, 1921.  
Contains sections on the utility of soybeans, pp. 25-26; a comparison of soybeans and cowpeas in the place they fill in the cropping system, pp. 26-28; mixtures of soybeans and other crops for hay production, pp. 55-56; and the use of soybeans for silage, pp. 56-57.
793. Lacey, James. Soy beans to the rescue. Hoard's Dairyman 63(8): 266-267. March 10, 1922. 44.8 H65  
Soy beans as a substitute when the clover crop fails and uses for the crop are suggested.
794. Landry, E. S., and Jenkins, J. M. . The Biloxi soybean. La. Agr. Col. Ext. Circ. 67 (reprint) [4]pp. Baton Rouge, 1924.  
Contains, p. [2], a discussion on the value of the soybean in a rotation with rice, from data obtained from 5-year experiments at the Rice Experiment Station, Crowley, La., and presented at a conference of bankers, canal men, rice growers and representatives of other organizations interested in the development of the rice industry of southwestern Louisiana, held at the Rice Experiment Station, Crowley, La., September 25, 1923. Harvesting methods are briefly mentioned, p. [4].
795. Landry, E. S. Rejuvenating prairie rice soils. Prog. Farmer Miss. Val. Ed. 39(25): 678. June 21, 1924. 6 So81  
The Biloxi soybean in rotation is suggested, with data based on a study for a number of years made at the Rice Experiment Station at Crowley, La. Cultural methods are also discussed.
796. The last call for soybeans. Dairy Farmer 20(9): 206-207. May 1, 1922. 44.8 K56  
This article is made up of statements by various farmers on their experiences with soybeans. Among the advantages of the crop mentioned are its uses for dairy cows, in combination with corn, for hay, to replace oilmeal, and the ease of threshing it.
797. Laude, H. H., and Zahnley, J. W. Soybeans in Kansas. Kansas Agr. Col. Ext. Circ. 48, 11pp. Manhattan, 1924.  
Includes, among other things, the value of soybeans as a crop, harvesting methods, and the use of soybeans in corn for hogging down.



798. Lining for more soy beans. Agr. Lime News Bull. 2(2): 1, 3-4. May 1921. 309.9 N21Ag

The wide soil adaptation of the soybean, the 50 percent increase in yield creditable to lining, the soybean as a soil builder, and its use in replacing a failing clover crop, are described.

799. Littlejohn, C. N. Soys for robber acres. Country Gent. 89(4): 22. Jan. 26, 1924. 6 C833

"A virtual reclamation of thousands upon thousands of acres of low, wet, unsafe lands in the Yazoo-Mississippi Delta is being wrought through the Laredo soy bean, which is further promising practically to solve the farmers' feed problems."

800. Louisiana State university and agricultural and mechanical college, Baton Rouge. Soybeans. La. Agr. Col. Ext. Circ. 157, 7pp. Baton Rouge, 1935.

This paper outlines the reasons for growing soybeans in Louisiana, harvesting for hay, value as a hay crop, and value for soil improvement.

801. Lovvorn, R. L., Kine, P. H., and Stitt, R. E. I. Factors in soybean production; II. Variety recommendations and characteristics. N. C. Agr. Expt. Sta. Agron. Inform. Circ. 102, 6pp., processed. State College Station, Raleigh, 1937.

Part I includes brief paragraphs on harvesting the seed and the use of the bean for soil improvement, pasturage and silage. Part II lists the varieties recommended for special purposes.

802. McC., J. W. Utilization of the soy bean crop. It is valuable for all kinds of stock. Orange Judd Farmer 66(14): 536, 555. Apr. 5, 1919. 6 Orl

The writer brings out the uses of soybean hay, the great financial value of soybeans as seed, the use of soybeans with corn for hogging down, soybeans as an aid to the corn crop, and the use of soys in the silo.

803. Macdonald, A. B. Ninety-day soys. They grow anywhere and will prove a life-saver to the man whose clover fails. Country Gent. 89(17): 4. Apr. 26, 1924. 6 C833

804. Malin, D. F. "Bill" McArthur's soy beans. Soy beans are all important in the cropping system at Ianoka Farm. Wallaces' Farmer 48(35): 1149. Aug. 31, 1923. 6 W15

Harvesting for hay, and the place of the beans in the crop rotation are mentioned.

805. Mark, P. Lewis. Sensible talk about soy beans. Rural New Yorker 82 (4773): 1514. Dec. 15, 1923. 6 R88

The author takes up the value of soybeans as a soil builder, the returns in wheat where soys have been grown, the uses of soys for seed, hay and forage, their limitations as pasture, yield of seed, and comparison with other crops.

806. Mathews, I. J. Corn-soybean combination. Ohio Farmer 143(17, whole no. 3711): 669-670. Apr. 26, 1919. 6 Oh3

These are the results of a questionnaire sent out to forty-four farmers on the corn-soybean combination. Some of the questions related to varieties, injury to corn, and use as food for pigs and stock.

807. Mathews, I. J. Soybean questions. Ohio Farmer 143(20, whole no. 3714): 782. May 17, 1919. 6 Oh3

Questions on suitable varieties of soybeans, and their preference to cowpeas for high sand are included.

808. Mathews, I. J. Soybeans in the rotation. How this valuable crop can be made to fit in. Successful Farming 20(2): 14, 35. February 1923. 6 Sul2

"With the facts set out above before us, it is no idle statement to say that the soybean can, and perforce must, come to occupy an important place in cornbelt rotation systems. They will grow on a soil so acid that clover does not thrive and they will secure the nitrogen from the air and transform it into soil nitrates...

"From the standpoint of the rotation, the most serious objection to soybeans is that as commonly planted, they need cultivating and this comes just at a time when the corn needs the same treatment. This year, a number of farmers have tried different ways to get rid of this cultivating when the corn needed attention."

809. Metzger, J. E., Holmes, M. G., and Bierman, Harlow. Soybeans: production, composition and feeding value. Md. Agr. Expt. Sta. Bull. 277, pp. 73-101. College Park, 1925.

The writers take up the place of soybeans in the crop rotation, the conditions influencing soybean yields, the varieties of soybeans, and soybean hay.

A section entitled "Soybean hay vs. wheat bran and mixed hay in milk production", by H. R. Bierman is included, pp. 89-95.

810. Minns, Edward R. Soy beans as a supplementary silage crop. A popular discussion for New York. N. Y. (Cornell) Agr. Expt. Sta. Bull. 310, pp. 257-274. Ithaca, 1912.

The feeding value of soybeans, their use as nitrogen gatherers, and harvesting methods are included.

811. Miyake, Koji, and Nakamura, Koji. On the effect of calcium oxide and calcium carbonate upon the decomposition of soy-bean cake and herring cake in two different soils. Jour. Biochem. 3(1): 27-54. July 1923. 385 J822

References, pp. 53-54.

Results of experiments at the Institute of Agricultural Chemistry of Hokkaido Imperial University, Sapporo.



812. Morse, William Joseph. The soy bean; a valuable leguminous crop for the north. Tribune Farmer 11(553): 1. June 6, 1912. 6 M484  
Includes a brief description of soybean harvesting methods and the uses for the crop.  
Following this paper, pp. 1-2, is a note on "Soy Beans as a Farm Crop," which is a summary of Farmers' Bulletin 372, and one, p. 2, entitled "Soy Beans as Supplemental Silage" which is based on Bulletin 310 of the Cornell Agricultural Experiment Station.
813. Morse, William Joseph. The soy bean: its culture and uses. U. S. Dept. Agr. Farmers' Bull. 973, 32pp. Washington, D. C., July 1918.  
This is superseded by Morse, W. J. Soy beans: Culture and Varieties. U. S. Dept. Agr. Farmers' Bull. 1520. Washington, D. C. April 1927. It does, however, contain additional material on the uses of soybeans for seed, for hay, for soiling, for pasture, for ensilage, and for soil improvement.
814. Morse, William Joseph. Soybeans for feed and fertility. 5pp., processed. [Washington, D. C., 1928.] 1.9 P691Sb  
Address given at the 29th annual meeting of the Association of southern agricultural workers, Memphis, Tenn., Feb. 2, 1928.  
"More general recognition by farmers of the value of the hay, pasture, seed, and oil meal undoubtedly will further stimulate the production of soybeans, especially in livestock sections. Reduced cost of production which agronomists are successfully bringing about, will naturally provide cheaper home-grown protein concentrates, and, therefore, more economical production of farm animals."
815. Noll, C. F. Soybeans for Pennsylvania. Penn. Agr. Expt. Sta. Rept. 1915: 47-57. Harrisburg, 1916.  
The author describes the value and uses of the crop as seed, green feed or hay, green manure, ensilage, for hog pastures and in the rotation. Yields obtained in variety tests 1913-1914 are also given, and soybeans and cowpeas are compared as to their value for forage and seed production.
816. O'Brien, Harry R. A visit to Soyland. Enthusiasts say this wonder crop fills a gap in corn belt rotations. Country Gent. 85(44): 11, 30. Oct. 30, 1920. 6 C833  
Cites the work of the Fouts brothers, who have built their entire farm management system around the soybean crop.
817. Ostrander, Ward A. A legume crop for soils and stock. Soybeans produce high-protein feed, and increase the productivity of worn land. Breeders' Gaz. 83(14, whole no. 2156): 463-464. April 5, 1923. 49 B74  
The use of soybeans for feed, harvesting methods, use of the beans with corn for silage, and expected yields are brought out. This article is worded in part as "Soybeans assure legumes for dairy farms" in Jersey Bull. and Dairy World 42(11): 505, 541, 542, 543. March 14, 1923. 43.8 J48

818. Park, J. B., Willard, C. J., and Borst, H. L. Growing soybeans in corn. Experiments on Ohio State university farm, Columbus. Ohio Agr. Expt. Sta. Monthly Bull. 7(5-6, whole nos. 77-78): 75-78. Wooster, May-June 1922.

This is a preliminary report of experiments conducted for the three-year period 1919-1921. A comparison is made of corn alone, corn drilled with soybeans, and soybeans alone.

819. Park, J. B. The soybean. Ohio Agr. Col. Ext. Bull. v. 15, no. 11, 4pp. Columbus, 1919-1920.

Uses of the crop, effect on corn yields when the two are planted together, harvesting for hay and seed, and threshing methods are briefly outlined.

820. Park, J. B. Varieties of soybeans for Ohio. Ohio Agr. Col. Ext. Serv. Crop Talk 8, 4pp. Columbus, 1924.

The varieties of soybean to plant for various uses are listed.

821. Phelps, C. S. The soy bean as a forage and seed crop. Conn. Agr. Expt. Sta. Bull. 22, 20pp. Storrs, 1901.

The author includes material on the feed value of the crop, yields, and harvesting.

822. Piper, C. V., and Nielsen, H. T. Soy beans. U. S. Dept. Agr. Farmers' Bull. 372, 26pp. Washington, D. C., 1909. 1 Ag84F

The bulletin takes up in part the importance of the soybean in the United States, the varieties of soybeans, their use for hay, for pasturage, in mixtures, for ensilage and for grain, their feeding value for sheep, dairy cows and hogs, and soybean grain as compared with cotton-seed meal.

823. A popular three-purpose legume. The soybean, which produces hay and seed high in protein and adds nitrogen to the soil, is a profitable cooperator. Breeder's Gaz. 81(17, whole no. 2107): 561-562. April 27, 1922. 49 B74

This is a series of articles including those by F. S. Wilkins (who cites soybean seed prices, value of soybeans per acre for feed, and their use as food and for poultry); R. E. Stephenson (who discusses the possibilities of the soybean in the United States, its value as a soil improver, value when grown with corn and ease of harvesting for hay); and B. E. Carmichael (who takes up its use in cattle feeding).

824. Reynolds, William. Soybeans on a stock-farm. Breeder's Gaz. 77(13, whole no. 1,999): 818. March 25, 1920. 49 B74

"Soybeans give a feed as rich in protein as alfalfa and require the least expensive of fertilizers if the soil is sweet and the seed is supplied with the proper bacteria by inoculation. In return for the inoculation in their unselfish way they leave more



than they take: a bountiful supply of high-priced nitrogen stored in the soil for the crop that is to follow. The farmer who gives the soybean a chance for his stock's and his farm's sakes will not be disappointed."

825. Riegel, W. E. Some soy bean suggestions. Veteran Illinois grower describes his methods of raising soy beans. Wallaces' Farmer 47(7): 216. Feb. 17, 1922. 6 W15  
There are included brief passages on the place of soybeans in the crop rotation, choice of variety, and time of harvesting.
826. Rusk, E. W. Beans protect corn from chinch bugs. Orange Judd Farmer 70(4): 105, 135. Feb. 15, 1922. 6 Orl  
Statements made by various farmers on the benefits of soybeans in controlling chinch bug damage are quoted.
827. Rusk, E. W. Soy beans as grown in Adams. Orange Judd Farmer 64(12): 3, 10. Mar. 23, 1918. 6 Orl  
It was found in Adams County, Illinois, that soybeans "are as sure a crop as any field crop we grow. They are not a wonder crop that will make a farmer rich all at once, but we believe we can use them in our regular farming business." Statements of various Adams County farmers on their experiences with soybeans are quoted.
828. Schmitz, Nickolas. Soybeans. Md. Agr. Expt. Sta. Bull. 201, pp. 131-158. College Park, 1917.  
Contains sections, pp. 131-136, on the uses of soybeans for hay, as a concentrate for dairy cows, as a concentrate for hogs, for hog pasture, for silage or soiling, and for soil improvement. Tables give analyses of soybeans for oil content, comparison of the soybean seed with some other concentrates commonly fed over the state, and with hay of the legumes commonly grown over the state.
829. Slipper, John A. The soybean and soil improvement. Ohio Agr. Col. Ext. Serv. Timely Soil Topics 71, 141pp. Columbus, 1924. 275.29 Oh32T  
The writer studies the benefits of the soybean from the soil standpoint, and the extent to which its mode of utilization modifies its soil improvement value.
830. Smith, C. B. Rotations in the corn belt. U. S. Dept. Agr. Yearbook, 1911: 325-336. Washington, D. C., 1912.  
Corn in rotation with cowpeas or soy beans, wheat, and clover, pp. 331-332, brings out the growing importance of soybeans in the corn belt.

831. Smith, William C. Soy beans with corn. Why farmers should grow them for the soil's sake. Country Gent. 84(20): 48, 50. May 17, 1919. 6 C833  
"Soy beans, properly inoculated, ought to be sown with every acre of corn grown anywhere in our country, for the one reason alone that they will put back into the soil more nitrogen than the corn crop consumes in its growth, and then the grower has the additional advantage of producing two crops where he grew but one before."  
Harvesting methods are also described.
832. Soy beans and cowpeas. Hoosier Hort. 15(9): 143. September 1933. 81 In2H  
Considers the possibility that "we have unknowingly pushed a better green manure crop to the rear and possibly into the discard. That discarded green manure crop might be cowpeas." The advantages of cowpeas over soybeans are brought out.
833. Soy beans on the dairy farm. Hoard's Dairyman 71(11): 467, 498-499. April 25, 1926. 44.8 H65  
The uses for soybeans on the dairy farm, their feeding value, expected yields per acre, and method of harvesting are among the matters taken up in this paper.
834. Sprague, Howard B. Soybeans for grain. N. J. Agr. 18(1): 2, 4. January-February 1936. 275.28 N46  
Among other things, the high feed value of soybean grain, soybeans in cattle rations, and the replacing of corn in the Middle West by soybeans are discussed.
835. Sprague, Howard B. Soybeans for grain. N. J. Agr. Expt. Sta. Circ. 373, 4pp. New Brunswick, 1937.  
The writer lists the reasons for the increased interest in soybeans, and discusses methods for growing and harvesting the crop, and the use of the beans in the crop rotation and in feeding rations.
836. Stewart, Robert. Soy beans in the corn belt. A three-use crop that works well in rotation. Country Gent. 82(18): 828. May 5, 1917. 6 C833  
An account of the crop rotation of corn, soybeans, wheat and clover, used by W. E. Riegel in Champaign County, Illinois.
837. Stone, William McD. The soybean and its uses. 30pp. [Alliance, Ohio, The Review press, 1913.] Pam. coll. 60.3 St  
Importance of the soybean as a protein feed, and as a cheap source of nitrogen, are discussed.
838. Stone, William McD. Soybeans and corn. 52pp. Alliance, Ohio, The Review press, 1914. 59 St72  
The soybean and protein problem, pp. 4-5; Soybeans for hay, pp. 8-9; The soybean and the nitrogen problem, pp. 9-11.



839. Thomasson, R. R. Soybeans to the rescue. Dairy Farmer 21(19): 16-17, 29. Oct. 1, 1923. 44.8 K56  
"The crop offers itself as a last chance for the man on the road to a completely wornout soil who has passed the turn in the road where he might have taken on clover in his crop rotation."
840. Trotter, Ide P. Soybeans and winter barley in one-year rotation. Mo. Agr. Col. Ext. Circ. 347, 4pp. Columbia, 1936.  
Soybeans as a legume hay for livestock, and the results of this rotation are discussed in part.
841. Turk, Lloyd M. The composition of soybean plants at various growth stages as related to their rate of decomposition and use as green manure. Mo. Agr. Expt. Sta. Research Bull. 173, 40pp. Columbia, 1932.  
Bibliography, pp. 38-40.  
"The following study is an attempt to measure by chemical means the differences in organic composition of the soybean plant parts, which accompany increasing maturity, and their differences in decomposition behavior in the soil. From this study it is hoped that an explanation can be given for the depressing effect of soybeans on the crop which follows."
842. U. S. Department of agriculture. Soy beans are profitable. Kimball's Dairy Farmer 17(6): 287. March 15, 1919. 44.8 K56  
"The soy bean, the most promising and profitable forage and grain crop which has been widely popularized during the last decade, merits a trial on every livestock farm and introduction into the permanent cropping schedule wherever the results indicate the wisdom of such procedure."
843. Van Wyk, N. J. Cowpeas and soybeans as fodder crops. Farming in South Africa 10(115): 44. October 1935. 24 So842  
"The advantage attaching to the cultivation of these crops does not consist only in the provision of better feed, for the plants, having deep roots, open up new sources of plant-food in the soil, thereby enriching it in mineral plant-foods and nitrogen as well as improving its physical condition. These plants therefore constitute ideal crops for the establishment of a sound rotation system with maize and teff."
844. Virginia. Department of agriculture and immigration. Comparison of the cowpea and the soy bean. Va. Dept. Agr. and Immigr. Bull. 253, pp. 65-66. Richmond, 1929. 2 V81B  
"A comparison of cowpeas and soy beans is not so much a matter of determining which is the best crop as it is a careful consideration of their climatic and soil adaptiveness and the special uses of each on the farm."

845. Walker, Ben H. Checking up the soys. Hoard's Dairyman 67(4): 114. Feb. 8, 1924. 44.8 H65

Describes the variety demonstration conducted by the Jackson County, Iowa, County Farm Bureau in order to determine the best varieties for various purposes.

846. Warner, H. W. Soys for soil fertility. Some experiences of men who have grown them. Successful Farming 21(3): 11, 41. March 1924. 6 Sul2

"Considering the great extent of soil acidity in the more humid parts of the country, 'acid-soil' legumes are certain to play an important part in our cropping systems...We will all be several years older before this acidity is corrected or even improved. In the meantime the farmer who cannot lime his fields will find the soybean a dependable and effective builder of humus and nitrogen."

847. Wiancko, A. T., Fisher, M. L., and Croner, C. O. Soybeans and cowpeas. Ind. Agr. Expt. Sta. Bull. 172, pp. 421-438. Lafayette, 1914. (Vol. 17)

A brief history of the beans; their uses and value, their place in the rotation, harvesting and threshing are discussed. This is reprinted in Mo. State Bd. Agr. Monthly Bull. 12(5): 8-27. May 1914. 2 M69B

848. Wiancko, A. T., and Mulvey, R. R. Soybeans in Indiana. Ind. Agr. Expt. Sta. Bull. 238(Rev.), 16pp. Lafayette, 1922.

An earlier edition, published in 1920, was written by A. T. Wiancko and C. O. Croner.

"Indiana farmers should make more extensive use of the soybean. Its chief value on the ordinary farm lies in its high feeding quality, as either grain, hay, or green forage, and in its beneficial effect upon the productiveness of the soil for crops which follow in the rotation. The soybean should find a place wherever additional protein feed is required, as it will readily take the place of such high-priced concentrates as tankage and cottonseed meal. On account of its nitrogen-fixing ability, it provides an excellent leguminous substitute whenever clover fails in the rotation. A fair trial of the soybean will easily demonstrate its claim to an important place in Indiana agriculture."

849. Wiggans, R. G. Soybeans in the northeast. Amer. Soc. Agron. Jour. 29(3): 227-235. March 1937. 4 An34P

"Paper No. 216, Department of Plant Breeding, Cornell University, Ithaca, N. Y. Also presented at the annual meeting of the Society held in Washington, D. C., November 18 to 20, 1936..." - Note.

"The object of this paper is to give certain experimental results as evidence upon which to form an opinion in regard to the pos-



sibilities of soybeans in the northeast and in New York State in particular."

The uses of soybeans as forage, for silage, and for grain are considered. It is concluded that "the place of the soybean plant in northeastern agriculture is not entirely clear, but that it shows sufficient promise to justify much more study and investigation within the area and a more thorough exploration of the northern soybean-producing areas of the world for more and better varieties suitable for the conditions under consideration."

850. Wilcox, E. V. Soy beans hobnobbing with corn. Country Gent. 85(21): 9, 33. May 22, 1920. 6 C833  
Reasons for the increased use of soybeans in the rotation on Corn-Belt farms are given.
851. Wilkins, F. S., and Hughes, H. D. Effect of sudan grass and of soybeans on the yield of corn. Amer. Soc. Agron. Jour. 26(11): 901-909. November 1934. 4 Am34P  
Literature cited, pp. 908-909.  
"Contribution from the Farm Crops Subsection, Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 188. Journal Paper No. J181 of the Iowa Agricultural Experiment Station..."  
"This paper gives the yields of corn following sudan grass and soybeans as compared with yields following oats as check through a 14-year period at the Iowa Experiment Station..."
852. Wilkins, F. S. Facts about soybeans in corn. Summary of results secured to date by different stations. Wallaces' Farmer 49(17): 661, 665. April 25, 1924. 6 W15
853. Williams, C. G. The soy bean. Ohio. Agr. Expt. Sta. Circ. 78, 8pp. Wooster, 1908.  
Uses of the soybean for hay, silage, seed, soiling, pasture and soil improvement, and harvesting the crop are described.
854. Williams, C. G., and Welton, F. A. The soybean and cowpea. Ohio Agr. Expt. Sta. Bull. 237, pp. 241-261. Wooster, 1912.  
The authors take up, pp. 241-256, the soybean, including its uses as grain, hay, silage, a soiling crop, pasture and a soil renewer, harvesting methods, and the enemies of the bean.
855. Wing, Joseph E. Meadows and pastures. 418pp. Chicago, The Breeder's Gazette, 1911. 60.1 W72M  
This book includes a very brief section on farm uses of soybeans, pp. 208-210, and quotes from Farmers' Bulletin 372, pp. 210-212, on soybeans.
856. Yoshimura, Kiyohisa, Nishida, Kotaro, and Yanada, Aritonō. [Organic fertilizers. VIII. The soy bean as a green manure.] Agr. Chem. Soc. Japan. Jour. 7(3, whole no. 78): 199-204. March 1931. J385 Ag8

Feeding

857. Agnoli, Di Renzo, and Untersteiner, Laura. Contenuto in vitamina A e B delle farine di lenti, di avena e di soja. Quaderni della Nutrizione 3(1-2): 44-48. March 1936. 389.8 Q2  
Bibliography, p. 48.  
A study of the vitamin A and B content of lentil, oat and soybean meal.
858. Agnoli, Di Renzo, and Untersteiner, Laura. Valore alimentare della farina di soja nella nutrizione dei giovani animali. Quaderni della Nutrizione 3(1-2): 42-43. March 1936. 389.8 Q2  
Growth experiments on young guinea pigs, showing the great food value of soybean meal in the nutrition of young animals.
859. Archer-Daniels-Midland Co., Milwaukee, Wis., Soybean division. 44% protein. New process soybean oil meal and soybean flakes. [6]pp. Milwaukee, Wis. [1937?] (Bull. no. 5) Pam. Coll. (Soybeans)  
Discussion of the feeding value of soybean oil meal.
860. Austin, Russell H. Effect of soil type and fertilizer treatment on the composition of the soybean plant. Amer. Soc. Agron. Jour. 22(2): 136-156. February 1930. 4 Am34P  
"A part of thesis presented to the Michigan State College in partial fulfillment of the requirement for the degree of doctor of philosophy..."  
"The value of the soybean plant for hay is dependent upon the composition of the plant. If the plant has not had access to sufficient amounts of the essential elements of plant food and is deficient in one or more of the essential elements, its feeding value is less than it would have been normally."  
Fertilizer tests with soybeans are described.
861. Bacharach, A. L. The growth-promoting properties of vitamin D. Quart. Jour. Pharm. 1(1): 49-60. January-March 1928. 396.8 Q2  
Soybean oil as a source of vitamin A, but not of vitamin D, as discovered in feeding tests, is discussed.
862. Bailey, S. Waldo. Soy beans for hay and silage. Rural New Yorker 78(4516): 67. Jan. 11, 1919. 6 R88  
The value of the hay and silage and harvesting methods are briefly described.
863. Beaumont, A. B., and Stitt, R. E. Soybeans for Massachusetts. Mass. Agr. Expt. Sta. Bull. 309, 16pp. Amherst, 1934.  
"To meet the emergencies of shortage in the supply of forage due to crop injury caused by soil or climatic limitations, an interest in certain special annual crops is warranted. This study was undertaken to determine the adaptability of soybeans for that purpose."



864. Becker, R. B., Neal, W. M., Dawson, C. R., and Arnold, P. T. Dix. Soy beans for silage. Fla. Agr. Expt. Sta. Bull. 255, 24pp. Gainesville, 1932.  
Literature cited, p. 24.  
"In order to obtain reliable information as to the feasibility of ensiling legume forages under Florida conditions, a study of several factors involved in this problem was undertaken with soybeans."
865. Beeson, K. E. Soy beans as a crop and feed. Grain & Feed Jours. Consolidated 66(12): 790. June 24, 1931. 298.8 G762  
"From address...before Indiana Grain Dealers Ass'n."  
Outline of results in feeding soybeans to beef cattle, hogs, lambs and poultry, is given. Expansion of soybean production for crushing purposes must depend, according to the author, "upon the extent to which their products, oil and meal, find a profitable market in competition with similar commodities already in the field."
866. Bibbins, A. L. Soy beans make a sure hay crop. Rural New Yorker 83(4792): 691. April 26, 1924. 6 R88  
The value of soybean hay, the method of making it, yield, and the success found in planting a combination of soybeans and sudan grass, are discussed.
867. Bliss, G. R. Producing pork, beef and milk with soy beans. Wallaces' Farmer 45(3): 162. Jan. 16, 1920. 6 W15  
The increase in soybean growing in Iowa, varieties suited to various uses, and soybeans for hogging down are discussed in part. It is said that the soybean is "going to prove a cheap source of beef, pork and mutton production, as well as one of the most potent factors in enriching the soil."
868. Bohstedt, G. Feeding soybeans and soybean oil meal. Flour & Feed 37(6): 18, 19. November 1936. 298.8 F66  
"For several years a nutritional research program with soybean oil meal has been conducted at the University of Wisconsin, which project has been supported by Allied Mills, Inc. This work was conducted on an industrial fellowship basis, where Dr. J. W. Hayward, during two years, was the research worker or industrial fellow who had immediate supervision of the work, and where Dr. H. J. Deobald has succeeded him...  
"One of the main objects has been the effect of varying degrees and duration of temperature employed in the process of manufacturing expeller soybean oil meal, and along with it hydraulic and solvent soybean oil meal. Pigs, poultry and laboratory rats were used for experimental animals..."

869. Bohstedt, G. Soys on a barnyard menu. Successful Farming 35(12): 24, 68-69. December 1937. 6 Sul2

An account of the methods in processing soybeans, and the means whereby the best oil meal may be selected for feeding purposes.

870. Briggs, George M. Soybeans and other supplementary feed crops. Wis. Agr. Col. Ext. Serv. Spec. Circ., 4pp. [n.p.] 1933. 275.29 W75S

The advantages of planting soybeans, harvesting for hay, and the use of the crop in mixtures are considered, among other things.

871. Brown, F. A. Sudan grass and soy beans for hay crops. Rural New Yorker 82(4768): 1390. Nov. 10, 1923. 6 R88

It is found that sudan grass and soybeans give "estimated yield, four to five tons of dry hay per acre, and a hay that is superior to Timothy in feeding value, and better liked by the stock."

872. Brown, L. C. Soy beans aid balanced farming. Orange Judd Farmer 70(2): 28, 34. Jan. 15, 1922. 6 Or1

"...We need to do closer figuring of costs. We need to grow more of those crops which can be utilized for balancing up corn in feeding dairy cows, hogs and beef cattle.

"Let's see how soybeans fill the gap."

873. Bunn, Abran. Soy beans - why not? Country Gent. 78(31): 1138-1139. Aug. 2, 1913. 6 C833

"The soy bean is going to do for the North what the cowpea is doing for the South, and it is going to do more. It will ultimately make us largely independent of the oilmeal for which we now pay tribute to the South and will lower the price of the mill feeds used so heavily in our dairying."

874. Burnett, L. C. Soybeans in the cornbelt. A crop that demonstrated its worth. Successful Farming 19(3): 18, 46. March 1920. 6 Sul2

"Feeders are now using all of the available supply and our only solution of the protein problem lies in our ability to produce more protein on cornbelt farms.

"The soybean is the crop best adapted for measuring the production of protein in this section. It is an annual legume; it will grow anywhere that corn grows, and with about the same degree of success. The ways in which it may be utilized are numerous and varied."

875. Christ, Heinrich. Stoffwechselversuche an wiederkäuern. (Sojabohnenschrot, mischfutter und zuckerschnitzel.) Zeitschrift für Züchtung. Reihe B. Tierzüchtung und Züchtungsbiologie 29(1): 67-84. January 1934. 442.8 Z35



Results of experiments on metabolism in ruminants. Extracted soybean meal was one of the feeds used.

876. Coultas, W. H. Soybean oilmeal. Flour & Feed 32(8): 23. January 1932. 298.8 F66  
"In this brief discussion, we will consider the importance of soybean oil meal as a livestock feed."
877. Culbertson, C. C. Getting the most out of the soy bean hay and grain. Bur. Farmer (Iowa Farm Bur. Messenger) 10(2): 20. October 1934. 280.82 B89  
Soybeans as feed for livestock.
878. Davis, Russell S. Legume crop for cornbelt farms. A Hereford breeder outlines his personal experiences with soybeans. Breeder's Gaz. 85(19, whole no. 2213): 575. May 8, 1924. 49 B74  
The writer cites the experiments of the Indiana Experiment station to show the profit in using soybeans for hog feed, and finds that they are also useful for stock feeding.
879. Dodson, W. R. Soybeans are valuable for silage when grown with other feed crops. U. S. Dept. Agr. Yearbook 1930: 489-490. Washington, D. C. 1 Ag84Y  
The writer describes a series of feeding experiments at the Iberia Livestock Experiment Farm near Jeanerette, La. Soybean harvesting problems are also outlined.
880. Edmondson, J. B. If your clover failed, try soybean hay. Successful Farming 30(5): 5, 56-57. May 1932. 6 Sul2  
Varieties to select for hay and the time of harvesting are briefly mentioned.
881. Elting, E. C., and LaMaster, J. P. Molasses as a preserving agent in making soybean silage. Assoc. South. Agr. Workers Proc. (1935)36: 506-507. 4 C82  
Abstract of paper.  
Gives the results of feeding tests.
882. Elting, E. C. Molasses as a preserving agent in making soybean silage. Jour. Dairy Sci. 18(7): 440. July 1935. 44.8 J822  
Abstract of paper presented at annual meeting of the American Dairy Science Association.  
"In the test herein reported blackstrap molasses was employed as a preserving agent in the making of soybean silage."
883. Enver, Ismail. Beitrag zur kenntnis der einwirkung verschiedenfach entfetteter sojaschrote auf das blutbild bei haustieren. 5lpp. [n.p., 1933] 444 En8  
Inaug.-diss. - Tierärztl. hochschule, Berlin.  
Bibliography, pp. 47-49.

This is a study of the influence of extracted soy meal on the blood form (blutbild) of domestic animals. It includes a general section on the soybean which brings out its importance and value and some of its uses in various countries.

884. Evvard, John M. Soybeans in stock rations. Wallaces' Farmer 57(4): 96. Feb. 20, 1932. 6 W15

The following questions which Mr. Evvard answers were asked by the editor of Wallaces' Farmer and Iowa Homestead: 1. Does soybean oil meal ever make soft pork? 2. Is there a difference in soybean oil meals? 3. How does soybean oil meal work with poultry? 4. What about feeding this oil meal to steers?

885. Gilchrist, Douglas A. Palm kernel cake, palm kernel meal, and cocoanut cake, compared with soya cake, for fattening cattle, young store cattle, and fattening sheep, 1915-1916. Northumb. Co. Ed. Com. Bull. 25, 8pp. Cockle Park, 1917. 103 N81B

Tables give summarized results of feeding experiments.

886. Godby, R. W. Why he grows soybeans. Soybean enthusiast reports on their feeding value. Wallaces' Farmer 54(18): 689-690. May 3, 1929. 6 W15

The writer has used soybeans as a protein supplement for milk cows, fattening calves, and hogs.

887. Gonzáles, A. de J. Cultivo y utilización de la soya como forraje. Revista de Agricultura, Comercio, y Trabajo (Cuba) 14(3): 5-42. September 1932. 8 Ag88Re  
References, p. 42.

This article takes up the cultivation and use of the soybean as forage. It describes, among other things, the food value of the soy, its agricultural history and uses in various countries, harvesting, expected returns from soybean crops (with tables giving figures); and uses in animal feeding; in combination with corn, sudan grass and cowpeas; in green forage; as hay; ensilage; utilization of the seed; use for soy cake; soybeans as feed for dairy cattle, for hogs, for sheep, for horses and mules, for poultry; and chemical composition and digestibility of the soybean.

The paper is based in large part on findings of experiment stations of the United States. Numerous tables show the return in seed for various varieties, chemical composition of seed of various varieties, chemical composition of soy hay (Mammoth variety), and digestible nutrients of soybeans in the various forms in which they are used for animal feed. A graph shows the digestible protein in soy cake as compared with other animal feeds.

888. Gouin, R. Le soja, fourrage vert. L'Agriculture Pratique 102(19): 657-659. May 7, 1938. 14 J82

This article on the use of the soybean as a green forage briefly describes the harvesting of the crop and discusses its nutritive value.



889. Grantham, A. E. Experiment with soy beans. Pract. Farmer 115(4): 68. Feb. 15, 1919. 6 P88  
The writer relates the experience of a farmer who found his soybeans were improved by inoculation, and the milk production of his cows and appearance of his stock and horses improved by the soybeans.
890. Grantham, A. E. Suggestions for growing soy beans. Pract. Farmer 112(9): 192. May 1, 1916. 6 P88  
The importance of soybeans for feeding livestock is included in this article.
891. Gt. Britain. Board of agriculture and fisheries. The soy bean. Gt. Brit. Bd. Agr. Jour. 16(9): 735-737. December 1909. 10 G79J  
Report of experiments designed to test the comparative feeding value of soybean cake and decorticated cotton cake.
892. [Gt. Britain. Board of agriculture and fisheries.] The utilisation of cereal offals and certain other products for feeding purposes. Roy. Soc. Arts Jour. 62(3230): 966-968. Oct. 16, 1914. 501 L847J  
"Special leaflet published by the Board of Agriculture and Fisheries." - Note.  
Includes a brief section on soybean cake and meal.
893. Great utility of the soy bean. Ohio Farmer 141(21, whole no. 3663): 695. May 25, 1918. 6 Oh3  
This article is made up of four letters, taking up 1) soybeans as a rich source of protein (J. L. Justice); 2) soybeans as a cause in increasing milk production (J. H. Withers); 3) soybeans as a feed for stock ("Bean Raiser"); and 4) soybeans as a good, though expensive food for hogs (G. C. Kreglow).
894. Hackleman, J. C. Future of the soybean as a forage crop. Amer. Soc. Agron. Jour. 16(3): 228-236. March 1924. 4 Am34P  
"Paper read as part of the symposium on 'The Forage Problem' at a meeting of the Society held in Chicago, Ill., November 12, 1923."  
"Summarizing, therefore, it would seem conservative to draw the following conclusions: First, that the acreage of soybeans will and should increase; second, that the most profitable outlet for the production will be as a seed crop and as a home-grown nitrogenous feed, substituting for the high-priced commercial concentrates; third, that applications of limestone to the soil must be recognized as essential to the most successful permanent production of soybeans; fourth, that, after sweetening the soil, more efficient methods of inoculation must be found; and, fifth, that legumes must be classified more nearly on the basis of their special or particular values. Alfalfa is pre-eminently a hay plant; sweet clover the best for green manure and pasture; red clover for dual-purpose hay and pasture legume; and soybeans the best annual nitrogenous seed and hay-producing plant."

895. Hansen, J. Sojabohnenkuchen. Deutsche Landwirtschaftliche Presse 36(41): 439-440; (42): 452-453. May 22, 26, 1909. 18 D482  
Feeding experiments with soybean cake.
896. Hansson, N. Sojamjöl och sojakakor. K. Landtbruks-Akademien, Stockholm. Handlingar och Tidskrift 48(3): 272-274. 1909.  
Libr. Cong. S11.S86  
"This is a discussion of the value of these two feeding stuffs [soybean meal and soy cake]..." - Expt. Sta. Rec. 21(5): 471. October 1909.
897. Hayden, C. C., and Perkins, A. E. Soybean hay and soybean silage. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(5, whole no. 122): 178-179. September-October 1926.  
The writers report a test to determine the preferability of curing the soybeans for hay or putting them into the silo with the corn.
898. Hayward, J. W. The nutritive value of soybean oil meal prepared by the different methods of oil extraction. Oil & Soap 14(12): 317-321. December 1937. 307.8 J82  
Literature cited, p. 321.  
"This article is primarily a review of the literature pertaining to the subject..." - Abstract, p. 317.
899. Hayward, J. W. Soybean oil meal. Recommendations on how to use it for maximum results. Flour & Feed 36(9): 18. February 1936. 298.8 F66  
Formulas are included.
900. Honcamp, F., Helms, W., Malkomesius, Ph., Meier, O., and Naumann, K. [New studies of the feeding value of different soybean extraction residues.] Zeitschrift für Züchtung. Reihe B: Tierzüchtung und Züchtungsbiologie 31: 355-371. 1935. 442.8 Z35  
Not examined.
901. Honcamp, Fr. Die sojabohne und ihre abfallprodukte. Die Landwirtschaftlichen Versuchs-Stationen 73(4-5): 241-284. [Aug. 9, 1910] 1910.  
Bibliography, p. 284.  
Investigations in the chemical composition of the soybean and the uses of it and its by-products for feeding.  
An extract from this appeared under the title: "Die Sojabohne und ihre Verwertung" in Tropenpflanzer 14(12): 613-634. December 1910. 26 T75
902. Honcamp, Fr. Ueber den wert der sojakuchen als futtermittel. Deutsche Landwirtschaftliche Presse 37(70): 757; (71): 769-770. Sept. 3-7, 1910. 18 D482  
A discussion of data obtained by different investigators who have conducted feeding tests with soy beans..." - Expt. Sta. Rec. 23: 772. 1910.



903. Horvath, A. A. Some biochemical aspects of soybean oil. Oil & Soap 15(3): 75-76. March 1938. 307.8 J82  
"The many peculiar effects of soybean oil feeding don't bear evident relationship to the composition of the fatty acids. The known 'impurities' as well as some unknown factors seem to play a leading role in defending its properties." - Abstract.
904. Illinois. Agricultural experiment station. Utilizing the soybean crop in livestock feeding. Ill. Agr. Expt. Sta. Circ. 369, 44pp. Urbana, 1931.  
Rapid increase in soybean acreage brings problem of utilization, by H. P. Rusk, pp. 3-4; Making use of soybeans in feeding dairy cattle, by W. B. Nevens, pp. 5-11; Soybeans for beef-cattle feeding, pp. 12-22; Soybeans for sheep, by W. G. Kammlade, pp. 23-26; Soybeans for horses and mules, by J. L. Edmonds and C. W. Crawford, pp. 27-29; Soybean crop has limited use in rations for swine, by W. E. Carroll, pp. 30-38; Objections to beans for fattening swine do not apply to soybean oil meal, by W. E. Carroll, pp. 39-41; Soybeans for poultry, by H. J. Sloan, pp. 42-44.
905. Iowa State college of agriculture and mechanic arts, Ames. Feeding soybeans. Iowa Agr. Col. Ext. Circ. 215, 24pp. Ames, 1935.  
Prepared by the staffs of the Iowa Agricultural Experiment Station and the Iowa State College.  
The value of soybeans as hay, straw, silage and pasture, and the use of the crop for dairy cows, beef cattle, sheep, swine, horses and mules, and poultry, are discussed.
906. Joliffe, C. F. Experience with soys. Natl. Stockman and Farmer 44(35): 1037. Nov. 27, 1920. 6 N21  
The author finds that soybeans grown for a hay crop are the most profitable of any he knows, the only objections being the difficulty of curing and the high cost of seed. These may be overcome.
907. Kapp, H. J. Great demand for soybeans. Grain & Feed Jours. Consolidated 72(12): 535. June 27, 1934. 298.8 G762  
"The drouth has brought the soybean into prominence in territories out of the regular producing areas, mainly as a forage crop to be sown on acres where government restrictions have been removed."
908. Kloser, Frank J. Soy beans with corn for silage. Wallaces' Farmer 44(17): 946. Apr. 25, 1919. 6 W15  
The advantages of growing soybeans with corn for silage and the best varieties for the purpose are briefly enumerated.
909. Lacey, James. Corn and soybeans for silage. Hoard's Dairyman 57(10): 499, 503. March 28, 1919. 44.8 H65  
The writer relates the experiences of Mike Flanagan of Lafayette

County, Wisconsin, in growing corn and soybeans for silage. Mr. Flanagan is quoted as saying "From the standpoint of labor saving and also of securing maximum production, I do not see how we can do better than to grow those splendid crops in the same field..."

910. Lebedev, I. A. Sneshannye posevy na korn kukuruzy soi podsolnechnika. 151rl1pp. [Moskva] 1932. 60 L492

"Spisok ispol'zovannoi literatury", pp. 150-152.

At head of title: Vsesoiuznyi Nauchnoissledovatel'skii Institut Soi i Spetsial'nykh Kul'tur.

Mixed sowings for fodder of maize, soybeans and sunflowers. Includes some discussion of yields per acre in mixed sowings of these crops, and their feeding value as silage.

911. Liu, T., and Chen, C. Y. [Nutritive value of soya-bean press-cake.] Science [China] 18(5): 636-648. May 1934. C475 Sci22

Text in Chinese.

"The cake contained 43% of protein with digestibility 77-81%, and nutrient val. similar to that of meat or caseinogen. It is deficient in vitamin-A." - Ch. Abs. in Brit. Chem. Abs. (Suppl. to Soc. Chem. Indus. Jour.) B:379. May 3, 1935. 382 B773

912. M., J. W. Value of soy beans. Rural New Yorker 79(4585): 901. May 8, 1920. 6 R88

The advantages of the crop, its valuable qualities and uses as feed, hay and for hogging down are outlined.

913. McArthur, William. Soybeans as emergency hay crop. Grower rates soys as best substitute for alfalfa or clover. Wallaces' Farmer 52(16): 620. April 22, 1927. 6 W15

This is the first of two articles telling "how to make use of soybeans with the greatest profit." The second follows in the issue of Wallaces' Farmer and Iowa Homestead for April 29, 1927, p. 656.

914. McArthur, William. Soybeans make hay on short notice. Northern Iowa farmer tells how beans fill the gap in a short hay year. Wallaces' Farmer 49(22): 820. May 30, 1924. 6 W15

Financial advantages of planting soybeans are mentioned.

915. Mathews, I. J. A crop that gives grain and hay. Soybeans supply legume hay and a high protein grain. Dairy Farmer 21(1): 5, 23. Jan. 1, 1923. 44.8 K56

"Farmers everywhere welcome the soybean as a crop that will give them a legume hay for feeding and a grain crop that can be ground and fed with corn silage to make a more nearly balanced ration, that can be produced right at home. But with this welcome comes specific problems of how best to work the crop into the rotation system; how to put them out so they will not compete with the corn, for labor is of first importance."



916. [Mitchell, H. H., and Beadles, Jessie R.] Soybeans found richer in certain vitamins than corn. Ill. Agr. Expt. Sta. Ann. Rept. (1935)48: 90-91. Urbana, 1936.  
Progress report of investigations. Vitamins A, B and G were studied in soybeans and corn. Report continued in Ill. Agr. Expt. Sta. Ann. Rept. (1935-36)49: 83. 1937, under title "Soybeans Much Poorer than Yellow Corn in Vitamin A."
917. Morrison, F. B. Feeds and feeding. A handbook for the student and stockman. Ed. 20., unabr., 1050pp. Ithaca, New York, The Morrison pub. co., 1936. 389.7 M833 Ed. 20  
"First to Ninth Editions by the late W. A. Henry...Tenth to Fourteenth Editions by W. A. Henry, assisted by F. B. Morrison. Fifteenth to Nineteenth Editions revised and rewritten by F. B. Morrison."  
Soybeans for forage, pp. 265-268; food value of soybeans, pp. 369-371; production of soybean oil, and use of the cake, pp. 371-372; soybean by-products, pp. 372-373; soybeans as feed for dairy cows, pp. 532-533; soybean hay, pp. 540-541; soybeans and soybean oil meal as feed for beef cattle, pp. 672-674; soybean hay for beef cattle, p. 680; soybean silage, p. 693; soybeans and soybean oil meal as feed for sheep, p. 759; soybean hay for sheep, p. 763; soybeans as feed for swine, pp. 886-888; soybean oil meal for swine, pp. 888-890; soybean oil meal combinations for swine, pp. 890-891; soybean pasture for swine, p. 902.
918. Neal, W. M., and Becker, R. B. A chemical study of ensiling soybeans. U. S. Dept. Agr. Jour. Agr. Research 46(7): 669-673. Washington, D. C., April 1, 1933. 1 Ag84J  
"Literature cited", p. 673.  
"In the course of an investigation of the feeding value of soybean silage, observations were made upon the normal changes that occur in soybeans during the ensiling process. These observations were made in an effort to determine the efficiency of the silo in preserving the feed nutrients of a legume roughage. Such information is of particular importance in regions where seasonal rainfall ordinarily prevents the satisfactory curing of hay."
919. O'Brien, Harry R. Soy-bean magic. Country Gent. 88(13): 4, 18. March 31, 1923. 6 C833  
Describes the results obtained by feeding soybeans to hogs, cows, poultry and horses.
920. Odland, T. E. Soybeans for silage and for hay. W. Va. Agr. Expt. Sta. Bull. 227, 24pp. Morgantown, 1930.  
"The purpose of this bulletin is to present the results of experiments conducted under West Virginia conditions...These

experiments include a test in which corn and soybeans were grown alone in various ways and in various combinations for silage purposes. In another experiment soybeans were grown alone and in combination with various other crops for hay. The experiments also include tests in which soybeans were sown at various rates and at different dates for hay."

921. Odle, L. A. Soy beans for stock feeding. Purdue Agr. 17(7): 134, 136. April 1923.

It is said that "if the farmers of the Corn Belt can produce a satisfactory protein, they are independent of limited amount and high prices" and that "the soybean seems to be the logical plant."

922. Purdue University Department of agricultural extension, Divisions of agronomy, dairy husbandry, animal husbandry, and poultry husbandry. Feeding soybeans and soybean oilmeal on Indiana farms. Ind. Agr. Col. Ext. Bull. 180, (rev.) 8pp. Lafayette, 1934.

"Ground or whole soybeans, and soybean oilmeal are being used in farm rations, and should be used as protein supplements rather than fattening feeds. Rations in which they may be fed satisfactorily to hogs, cattle, sheep and poultry are indicated in this publication, together with safeguards in their use, comparisons of soybean hay with other legume hay in sheep and cattle feeding operations are also reported.

"Recommendations are based on results of experimental work at the Purdue University Experiment Station."

923. Richey, P. S. Soybeans for cornbelt stock-farms. Breeders' Gaz. 75(23, whole no. 1958): 1358. June 5, 1919. 49 B74

"The soybean has a great future in the cornbelt. No other legume yields so great a quantity of digestible protein to the acre. No other legume is so easily or so quickly grown. It supplies a home-grown protein supplement to the standard cornbelt grain crops at less expense than it can be supplied by any other source. It is worthy of consideration on every farm, and specially on farms where live stock is raised and prepared for market."

924. Robison, W. L. The influence of the method of oil extraction on the feeding value of soybean oilmeals. Amer. Soc. Anim. Prod. Proc. (1924): 60-63. 1925. 389.9 Am3R

Results of trials at the Ohio Agricultural Experiment Station.

"If the results of the two trials are indicative of what may ordinarily be expected from the use of these different types of soybean oilmeals, the expeller meal with a nut-like taste and odor and the hydraulic meal will prove valuable feeds, while the solvent meal and the raw-tasting expeller meal will be found unsatisfactory."



925. Roquemore, Everett E. Soybean oil meal high protein feed. Flour & Feed 32(11): 16-17. April 1932. 298.8 F66  
The uses for the soybean, and its popularity as a feed are discussed. The many uses for the crop now being discovered and the acreage reduction in it are seen as causes for higher prices.
926. Scheffbeck, Willi. Über sojabohnenvergiftung und vergiftung mit chlorkohlenstoffen. 41pp. [Kallmünz, Gedruckt bei M. Lassleben] 1926. 391 Sch2  
Inaug.-diss. - Tierärztl. hochschule, Hannover.  
"Literaturverzeichnis", page after p. 41.  
This is an account of research on soybean poisoning and poisoning with carbon tetrachloride in animals.
927. Scheunert, A., and Richter, K. Der wert der sojabohne als futtermittel. Fortschritte der Landwirtschaft 3(24): 1130-1133. Dec. 15, 1928. 19 F77  
Feeding experiments with rats to test the nutritive value of extracted and unextracted soybeans as animal food.
928. Semple, A. T. Feeding soybeans. Successful Farming 33(11): 41-42. November 1935. 6 Sul2  
Contains directions for feeding soybeans to various animals.
929. Seulke, K. J. Formula changes and why. Flour & Feed 34(9): 20, 21. February 1934. 298.8 F66  
Experiments undertaken by various experimenters showing the value of soybean oil meal as a source of protein in animal nutrition are cited, including cattle, hogs and poultry. It is concluded that "Formula changes contemplated by feed manufacturers should take into consideration the incorporation of soybean oil meal both from the standpoint of economy and the welfare of the feeder of their product."
930. Shrewsbury, Charles L., and Bratzler, John W. Cystine deficiency of soybean protein at various levels, in a purified ration and as a supplement to corn. U. S. Dept. Agr. Jour. Agr. Research 47(11): 889-893. Washington, D. C., Dec. 1, 1933. 1 Ag84J  
"A part of the material in this paper was submitted by the junior author to the School of Agriculture, Purdue University, as a thesis in partial fulfillment of the requirements for the bachelor of science degree." - Ed. note.  
"Soybeans are generally fed to livestock as a supplement to corn or other carbohydrate-rich feed. The experiments described in this paper were designed to reinvestigate the reported deficiency of soybean protein at a level of 10 percent, to determine whether a cystine deficiency existed at a protein level of 15 percent, and whether a ration made from corn and soybeans, such as is used in swine feeding, would exhibit a cystine deficiency."

931. Slate, William L., Jr., and Brown, B. A. Corn and soybeans as a combination crop for silage. Conn. Agr. Expt. Sta. Bull. 133, pp. 353-[378.] Storrs, 1925.

Bibliography, p. 376.

This is a report of four years' work with corn and soybeans for silage.

"To be of any great value the soybeans must sufficiently reduce the nutritive ratio and increase the total yield of feed per acre, to pay a profit on the cost of adding them to the farm crop." The various problems connected with the growing of the crops in combination are discussed.

932. Some facts about soy bean meal. Corn belt farmers ought to use more of this superior high protein feed. Bur. Farmer (Ill. Agr. Assoc. Sec.) 7(2): 12. October 1931. 280.82 B89

"Live stock feeders, particularly in the corn belt, should use this superior protein supplement. In many cases these same farmers are growing soy beans for sale as a cash crop. A satisfactory market for commercial soy beans is directly dependent upon a larger consumption of soy bean oilmeal in live stock feeding."

933. Soule, Andrew M., and Fain, John R. Crops for the silo. Tenn. Agr. Expt. Sta. Bull. v. 17, no. 1, 24pp. Knoxville, January, 1904.

Soybeans are among the crops considered. Costs of cultivating the crops, harvesting costs, and their value for silage are discussed.

934. [Soybean cake as a food.] Agr. Chem. Soc. Japan Jour. 7(2, whole no. 77): 87-96. February 1931. J385 Ag8

Bibliography, p. 96.

I. Oil-extracting process and digestion coefficient of the protein, by S. Izume and Y. Yoshimaru.

II. Nutritive value of the alcohol-extracted oil cake, by S. Izume, Y. Yoshimaru, and I. Konatsubara.

III. Effect of addition of the soya-bean oil cake to other grain, by S. Izume and I. Konatsubara.

Abstracted by Chemical Abstracts in Brit. Chem. Abs. (Suppl. to Soc. Chem. Indus. Jour.)B: 1119. Dec. 11, 1931. 382 B773

935. Soybean meal day at Wooster. Flour & Feed 36(6): 8-9.. November 1935. 298.8 F66

"The annual Feed Merchants' Day at Ohio Agricultural Experiment station, Wooster, on Oct. 9, brought together nearly two hundred men interested in feeds and feeding..."

Abstracts and excerpts from some of the speeches on soybean meal as a valuable ingredient for feeds are given.

936. Soy flour in dog food. Natl. Provisioner 98(19): 25. May 7, 1938. 286.85 N21

The food value of the soy flour is described.



937. Ten Eyck, A. M. Cowpeas vs. soy beans. Orange Judd Farmer 60(22): 6. May 27, 1916. 6 Orl  
Cowpeas, rather than soybeans, are recommended for Winnebago County (Illinois) farmers, because the writer feels that the latter "are not productive enough to be a valuable crop for feed, either as forage or grain."
938. Terroine, E. Laits artificiels pour l'élevage du bétail. Société d'Hygiène Alimentaire Bull. 19(1-2): 1-23. 1931. 389.9 SolB  
Bibliography, p. 23.  
Includes a section on the feeding of soy milk to animals, with tables showing results.
939. Thatcher, L. E. Corn and soybeans for silage. Yields obtained in experiments at Wooster. Ohio Agr. Expt. Sta. Monthly Bull. 7(5-6, whole nos. 77-78): 79-81. Wooster, May-June, 1922.  
"The results obtained [1917-1921] from growing soybeans with corn for silage by the Agronomy Department of the Ohio Agricultural Experiment Station at Wooster agree, in the main, with those obtained at Columbus by the Department of Farm Crops as reported in the...article, 'Growing Soybeans in Corn' [in this same issue of the Monthly Bulletin, pp. 75-78].  
"This experiment indicates that in a combination of soybeans and corn or sunflowers, the yield of the soybeans is determined by the amount of competition with the companion crop, a competition which varies greatly with the rate and method of planting and with weather conditions, as is pointed out in the preceding article."
940. Thatcher, L. E., and Park, J. B. Protein content of soybean hay. Ohio Agr. Expt. Sta. Bimonthly Bull. 183, pp. 131-136. November-December 1936.  
It is pointed out that "the protein content of soybean hay is influenced by the stage of development at the time of harvest."  
The results of harvesting experiments are given.
941. Thompson, John. Growing soybeans for hay. Wallaces' Farmer 55(16): 796-797. Apr. 19, 1930. 6 W15  
"This legume should be used more as a catch crop."
942. Titus, Harry W. Soybeans and soybean (oil cake) meal. Grain & Feed Jours. Consolidated 71(7): 306-307. Oct. 11, 1933. 298.8 G762  
A discussion of the feed value of soybeans and oil meal.
943. Tomlinson, Walter S. Soybeans planted with corn. Ohio Farmer 137(21, whole no. 3558): 707. May 20, 1916. 6 Oh3  
Cultivation, harvesting, yields, and use of the crop for silage are briefly mentioned.

944. Watson, C. J., Woodward, J. C., Davidson, W. M., Muir, G. W., and Robinson, C. H. The digestibility of Canadian feeding stuffs - soybean oil meal. Scientific Agr. 17(1): 22-30. September 1936. 7 Sci2

Literature cited, p. 27.

"Continuing the studies on the digestibility of Canadian feeding stuffs, data are presented in this paper for soybean oil meal, produced by the expeller process. A comparison is also made between the feeding values of this soybean oil meal and of linseed oil meal upon the basis of digestibility trials."

A résumé of the article appears in French on p. 27.

945. Whittier, A. C. A study of soy bean hay. Del. Agr. Expt. Sta. Bull. 112, 18pp. Newark, 1916.

The following summary is given:

"Special chemical determinations on soy bean hay were made. Chemical tests of soy bean hay with reference to the possible presence of a compound which acts unfavorably on the animal organism are recorded. Methods of extraction and feeding of same to guinea pigs are described and discussed. An extract of soy bean hay was obtained which is poisonous. This extract which is soluble in 70 to 80% alcohol and water and precipitated by lead acetate was found to be poisonous to guinea pigs."

946. Wiggans, R. G. Corn and soybeans for silage. N. Y. (Cornell) Agr. Expt. Sta. Bull. 548, 36pp. Ithaca, 1932.

References, pp. 35-36.

"There are very few users of silage who would not, other things being equal, choose to use corn-soybean silage rather than silage made from corn alone. The problem, then, is not a question of the relative value of the two kinds of silage, but how to produce the better feed economically and, if possible, at no greater cost than is incurred in the production of straight corn silage. It is the purpose of this publication to report experimental work relating to this problem..."

947. Wiggans, R. G. Effect of growing corn and soybeans in combination on the percentage of dry matter in the two crops. Amer. Soc. Agron. Jour. 26(1): 59-65. January 1934. 4 An34P

"Paper No. 195, Department of Plant Breeding, Cornell University, Ithaca, New York..." - Note.

"During the past 9 years a series of experiments have been conducted at the Cornell University Agricultural Experiment Station for the purpose of studying the possibilities of the soybean as a silage crop in combination with corn. The results of these tests are being published as Station Bulletin 548, 1932..."

"In connection with these experiments it was necessary to take many shrinkage samples, since the value of silage is very largely dependent on total dry weight. The purpose of this paper is to



report the effect of growing corn and soybeans in combination on the percentage of dry matter in the two crops."

948. Wiggans, R. G. Pole beans vs. soybeans as a companion crop with corn for silage. Amer. Soc. Agron. Jour. 27(2): 154-158. February 1935. 4 Am34P  
"Paper No. 207, Department of Plant Breeding, Cornell University, Ithaca, New York..." - Ed. note.  
"The purpose of this brief report is to present data obtained from experiments planned to give information on this problem."
949. Wilkins, F. S. Growing soy beans in corn. Wallaces' Farmer 47(19): 608. May 12, 1922. 6 W15  
"That it is a profitable practice to plant soy beans with corn for silage is indicated by results to date of experiments conducted by the farm crops section of the Iowa experiment station. These results show an increase in total silage yield per acre for land on which soy beans were grown with the corn, over land which grew corn alone...The results of these feeding tests confirm the statements of many farmers that soy beans and corn mixed together in the silo make a much more satisfactory feed than corn silage alone."
950. Wilkins, F. S. Use soy beans to replace oil meal. Iowa farmer describes his methods of growing beans for a seed crop. Wallaces' Farmer 74(14): 456. Apr. 7, 1922. 6 W15  
William McArthur, of Cerro Gordo County, Iowa, shews that it is "a paying proposition to grow soy beans for feed to take the place of oil meal as feed for stock."
951. Willard, C. J. Soybean hay. Ohio Agr. Col. Ext. Serv. Crop Talk 12, 14pp. Columbus, 1924.  
Soybeans as a supplement to clover, harvesting of the beans, handling of the hay, and value of the hay are considered.
952. Wisconsin. Agricultural experiment station. Findings in farm science. Annual report of the Director (1935-36) 53d, 168pp. Madison, 1937. (Bull. 438)  
The section Poultry and Game Birds has a subsection entitled: Learn More About the Value of Soybean Oilmeal for Poultry, pp. 56-57, in which it is stated:  
"A feeding trial this past year sought to determine whether larger than ordinary supplements of minerals are needed with soybean oilmeal rations. It is a common practice to feed extra minerals with them. However, the work done here by H. J. Deobald (Allied Mills, Inc., Industrial Fellow), J. G. Halpin, and C. E. Holmes (Poultry Husbandry) demonstrates that if the birds are allowed to run in the sunlight at all times except in the most severe winter weather, rickets will be prevented and normal growth secured when the ration contains 2% limestone..."

The section on Animal Nutrition has a subsection entitled "Study Nutritive Value of Soybean Proteins," pp. 130-131. In this it is said that "It is highly desirable to know why soybean oilmeal gives poor results when prepared at low temperatures. If this were thoroughly understood, it might be found practical to adjust or fortify soybean rations so that even raw soybeans could successfully be fed.

"With this idea in mind feeding trials with rats have been continued by M. Johnson, H. Steenbock (Agr. Chemistry), and H. T. Parsons (Home Economics).

953. Withrow, W. A. Growing soy beans in Indiana. Rural New Yorker 78 (4522): 303. Feb. 22, 1919. 6 R88

Varieties for silage and hay are suggested, and the yield which may be expected is mentioned.

954. Wright, P. A., and Shaw, R. H. A study of ensiling a mixture of sudan grass with a legume. U. S. Dept. Agr. Jour. Agr. Research 28(3): 255-259. Washington, D. C., Apr. 19, 1924. 1 Ag84J

"This paper reports a study of ensiling a silage crop high in protein and low in carbohydrates, mixed with one low in protein and high in carbohydrates, to determine whether such a mixture makes better silage than the same crops ensiled separately.

"Two legumes, soybeans and cowpeas, were the high-protein crops used, and Sudan grass was the low-protein, high carbohydrate crop."

### Cattle

955. Anthony, Ernest L., and Henderson, H. C. Soybean vs. alfalfa hay for milk production. W. Va. Agr. Expt. Sta. Bull. 181, 10pp. Morgantown, 1923.

"In order to ascertain how the soybean compares with alfalfa as a feed for the production of milk, the following experiment was planned in which soybean hay was to be fed in comparison with alfalfa hay."

956. Barney, F. C. I'd feed ground soybeans to a dairy herd. Successful Farming 34(12): 62-63. December 1936. 6 S42

"Soybeans are admittedly a cheap, home-grown source of protein. At the same time their fat content (around 17 percent) probably is of more importance and value in the dairy ration than many dairymen realize."

957. Bechdel, S. I. Soybean hay for milk production. Pa. Agr. Expt. Sta. Bull. 201, 16pp. State College, 1926.  
Literature cited, p. 16.



"The purpose of this bulletin is to report the results of feeding trials in which soybean hay was compared with alfalfa hay for milk production. Since soybean hay carries digestible nutrients just slightly higher in amount than alfalfa hay...it is evident that the comparison should give reliable information on the feeding value of the former."

958. Briggs, George M. Soy beans as an economical dairy feed. Hoard's Dairyman 65(15): 556. April 27, 1923. 44.8 H65

"Those farmers...raising soy beans have certainly found as near a substitute for linseed and cottonseed meal as can be found on the market. The wonderful results from soy bean hay and ground beans should inspire anyone at all interested in economical dairy production."

959. Bruce, W. Report on cattle-feeding experiments, 1909-1910. Edinburgh & East of Scotland Col. Agr. Bull. 21, 15pp. Edinburgh, 1910. 103 Ed4B

"These experiments were undertaken for the purpose of testing Soya bean-cake as a feeding-stuff in comparison with linseed-cake."

960. Caldwell, R. E. The value of soybean and alfalfa hay in milk production. Ohio Agr. Expt. Sta. Bull. 267, pp. 125-145. Wooster, 1913.

This bulletin gives the results of two experiments whose purpose is to discover whether home-grown feeds may be used to produce dairy products, inasmuch as the cost of nitrogenous concentrates is almost too high for some dairymen. In the first experiment, soybean hay is compared with bran and cotton-seed meal as a source of protein, pp. 125-138. A financial statement is included.

961. Cannon, C. Y., and Johnston, Floyd. Soybeans for dairy cows. Iowa Agr. Col. Ext. Bull. 196, 16pp. Ames, 1934.

Value of soybeans in the dairy ration, and growing and harvesting the crop are explained.

962. Clemson Agricultural college of South Carolina, Clemson College. Influence of ground soybeans on market milk production. S. C. Agr. Expt. Sta. Rept. (1929)42: 54-55. Clemson College, 1929.

"There is a conflict of opinion and experimental evidence as to the effect of soybeans on dairy products. In January, February and March, 1929, a study was made of the influence of ground soybeans on the flavor and odor of market milk, and on the flavor, odor, and texture of butter obtained by churning cream from cows being fed soybeans in different proportions in their grain mixtures."

963. Cook, Alfred S. Soy bean meal vs. cotton seed meal. N. J. Agr. Expt. Sta. Ann. Rept. (1913)34: 293-316. Trenton, 1914.

This is also the 26th Annual report of the New Jersey Agricultural College Experiment Station.

The object of the experiment was: "1. To determine the feeding value of Soy Bean meal as compared with Cotton Seed meal. 2. To determine whether Soy Bean meal in connection with home-grown Corn meal will produce milk more economically than a ration containing purchased grains."

Numerous tables show the milk and butterfat production of each group of cows on soybean meal and cotton seed meal rations, and the yield and costs of producing milk and butterfat on these rations.

964. Duggar, J. F. Vetch, cowpea, and soy bean hay as substitutes for wheat bran. Ala. Agr. Expt. Sta. Bull. 123, pp. 49-72. Montgomery, 1903.

"The object of the feeding experiments herein described was to ascertain whether hay made from hairy vetch, cowpeas and soy beans could be advantageously substituted for most of the wheat bran in the ration of dairy cows."

965. Fairchild, L. H., and Wilbur, J. W. Soy bean oilmeal and ground soy beans as protein supplements in dairy rations. Jour. Dairy Sci. 8(3): 238-245. May 1925. 44.8 J82

References, p. 245.

"An experiment, divided into two parts, has recently been completed at the Purdue Experiment Station. The first part of this experiment was conducted to compare the value of soy bean oilmeal with linseed oilmeal as protein supplements in the grain ration of the dairy cow. The second part compared the value of ground soy beans with linseed oilmeal for milk and fat production."

966. Fairchild, L. H., and Wilbur, J. W. Soybean oilmeal and ground soybeans as protein supplements in the dairy ration. Ind. Agr. Expt. Sta. Bull. 289, 20pp. Lafayette, 1924.

References, p. 20.

"The objects of this experiment were: 1. To make comparisons of the value of soybean oilmeal and ground soybeans with linseed oilmeal as protein supplements in the dairy ration. 2. To determine the effect of the addition of a mineral mixture to this ration."

967. Forbes, E. B., Braman, Winfred W., and Kriss, Max. Net-energy values of corn silage, soy-bean hay, alfalfa hay, and oats. U. S. Dept. Agr. Jour. Agr. Research 34(8): 785-796. Washington, D. C., April 15, 1927. 1 Ag84J

"With the cooperation of J. August Fries, C. D. Jeffries, R. W. Swift, Rowland B. French, and J. V. Maucher, Jr..."

"The following net-energy values, per kilogram of dry matter of feeds, for the maintenance of approximately 800-pound 2 to 3 year old beef steers are submitted, these values being determined by direct calorimetry, using the heat production during fast as the measure of the maintenance requirement of net energy: Corn silage, 2,098 Calories; soy-bean hay, 1,502 and 1,689 Calories; alfalfa hay, 1,272 and 1,327 Calories; and ground oats, 2,224 and 2,476 Calories..." - Summary p. 795.



968. Gerlaugh, Paul. Soybean oilmeal in cattle fattening rations. Grain & Feed Jours. Consolidated 75(6): 270. Sept. 25, 1935. 298.8 G762  
Results of feeding experiments at the Ohio Agricultural Experiment Station.
969. Gilchrist, Douglas A. Soya beans and soya cakes. Mark Lane Express 100(4054): 667. June 7, 1909. 10 M34  
Reports effects on quantity and quality of milk produced and on live weights of cows in soybean feeding experiments.
970. Grinnells, C. D., and Moore, J. L. The comparative values of peanut and soybean hay for milk production. Assoc. South. Agr. Workers Proc. (1937)38: 235, processed. [Atlanta, Ga., 1937.] 4 C82  
Abstract of paper.  
Tabulates the results of three trials.
971. Grinnells, C. D., and Moore, J. L. The comparative values of peanut and soybean hay for milk production. N. C. Agr. Expt. Sta. Bull. 312, 28pp. Raleigh, 1937.  
"The data indicate that peanut hay of similar quality is equal to soybean hay for milk production. The results from one feeding trial do not, however, warrant one in drawing definite conclusions...  
"The price of the peanut hay usually runs about one-third less than that of soybean. On a basis of feed cost per hundred pounds of milk, considerable saving may be effected by the use of peanut hay in feeding dairy cows."
972. Grinnells, C. D., and Moore, J. L. Peanut versus soybean hay for dairy cattle. Assoc. South. Agr. Workers Proc. (1937)38: 225, processed. [Atlanta, Ga., 1937.] 4 C82  
Abstract of paper.  
Gives the results of three feeding trials, in which it was found that good peanut hay is of equal or slightly greater value than an equal quantity of soybean hay.
973. Hansson, Nils. Wert der sojakuchen und des sojamehls bei der fütterung von milchkühen. Fühlings Landwirtschaftliche Zeitung 59(2): 49-63. Jan. 15, 1910. 18 F95  
This is an account of experiments conducted in Sweden on the use of sunflower cake, soybean meal and soybean cake in the feeding of milking cows.  
An article with a similar title appeared in Stockholm. Meddelande från Centralanstalten för Försöksväsendet på Jordbruksområdet no. 15, p. 51. 1910.
974. Hauge, S. M., Wilbur, J. W., and Hilton, J. H. A further study of the factor in soybeans affecting vitamin A value of butter. Jour. Dairy Sci. 20(2): 87-91. February 1937. 44.8 J822  
References, p. 91.

"1. Further studies have been made of the vitamin A suppressing factor in soybeans which interferes with the transference of the vitamin A activity of the feed to the butterfat secreted by dairy cows. 2. This factor was found to be distributed in both the soybean oil and soybean oil meal secured by either the expeller process or by chemical solvents. 3. The suppressing action is not due to the presence of oil in the ration but to some factor in soybean oil in the bean. 4. Prolonged extraction of soybeans first with ethyl ether and then with ethyl alcohol failed completely to remove this factor..." - Summary, pp. 90-91.

975. Hayden, C. C. Alfalfa and soybean hay for growing heifers. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(3, whole no. 120): 98-103. Wooster, May-June 1926.

Among the conclusions it is stated that "the results show alfalfa hay to be a little superior to soybean hay and the previous test showed alfalfa hay a little superior to clover hay for heifers when liberally fed with corn."

976. Hayden, C. C., and Perkins, A. E. Soybean hay and soybean silage. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(5, whole no. 122): 178-179. September-October 1926.

Among the conclusions the following is made:

"1. This one test is not sufficient to warrant final conclusions but it indicates practically no difference in the feeding value of soybeans preserved by the two methods. Dairymen probably can use either method with equally good results."

977. Hayden, C. C., and Perkins, A. E. Soybeans and soybean oilmeal for milk production. Ohio Agr. Expt. Sta. Bimonthly Bull. 11(4, whole no. 121): 137-141. July-August 1926.

This is an account of the results of two tests on the use of soybeans as a source of protein in dairy rations: One test compares ground soybeans with linseed oilmeal, and the other compares soybean oilmeal with linseed oilmeal.

978. Herrmann, L. F., and Bowling, G. A. Soy bean hay as a sole roughage for dairy cows. Jour. Dairy Sci. 19(7): 461-462. July 1936.

Abstract of paper presented at annual meeting of American Dairy Science Association.

"Two trials were conducted to determine if soy bean hay as the sole roughage in the ration is as efficient as soy bean hay and corn silage."

979. Hilton, J. H., Wilbur, J. W., and Hauge, S. M. A comparison between ground soybeans and linseed oilmeal as protein supplements for growing dairy calves. Jour. Dairy Sci. 15(4): 277-281. July 1932. 44.8 J822

References, p. 281.



At the end of two trials upon eight calves, at the Purdue Agricultural Experiment Station, it is said that "ground raw soybeans and linseed oilmeal were found to be equally effective as protein supplements in the grain rations for growing heifer calves when fed with alfalfa hay."

980. Hilton, J. H., Wilbur, J. W., and Epple, W. F. Early, intermediate and late cut soybean hay for milk and butterfat production. Ind. Agr. Expt. Sta. Bull. 346, 24pp. Lafayette, 1931.  
Bibliography, p. 24.  
This bulletin gives the results of three experiments, covering a three-year period, carried out with the object of comparing the relative feeding value of soybean hay cut in different stages of maturity for milk and fat production. Time to harvest soybeans for hay, pp. 3-5; Yields per acre at different stages of maturity, pp. 9-10.
981. Hilton, J. H., Wilbur, J. W., and Hauge, S. M. Ground soybeans and linseed oil meal for growing dairy calves. Ind. Agr. Expt. Sta. Bull. 354, 8pp. Lafayette, 1931.  
Bibliography inside back cover.  
"Results of the feeding trials reported in this Bulletin show that ground soybeans are equal to linseed oilmeal as a protein supplement in the grain ration for growing dairy calves."
982. Hilton, J. H., Hauge, S. M., and Wilbur, J. W. The vitamin A activity of butter produced by cows fed alfalfa hay and soybean hay cut at different stages of maturity. Jour. Dairy Sci. 18(12): 795-800. December 1935. 44.8 J822  
References, p. 800.  
"Comparisons were made of the vitamin A value of artificially dried and field cured alfalfa and soybean hay, cut at two different stages of maturity. Studies were also made of the relationship between the vitamin A activity of the hays and the butters produced by cows fed these respective hays..."  
Abstract in Jour. Dairy Sci. 18(7): 434. July 1935. 44.8 J822
983. Hilton, J. H., and Wilbur, J. W. When should we cut soybeans for hay? Successful Farming 29(7): 7, 43. July 1931. 6 Sul2  
An account of the results obtained from trials held at the Purdue University Agricultural Experiment Station with cattle "to determine the relative value for milk and fat production of the hay when cut in different stages of maturity."
984. Holdaway, C. W., Ellett, W. B., and Harris, W. G. The comparative value of peanut meal, cottonseed meal and soybean meal as sources of protein for milk production. Va. Agr. Expt. Sta. Tech. Bull. 28, 43pp. Blacksburg, 1925.  
Literature cited, p. 43.

"The work here reported is a compilation of data of feeding trials with peanut meal, cottonseed meal, and soybean meal...

"Since no satisfactory method has been found to compare the utilization of feed protein for milk production under all conditions, two methods are used in the case of the three concentrates being tested. An analysis of the results will be made from the standpoint of the total protein and its relation to the results and from the digestible crude protein, not considering the nitrogen balance or the metabolic feces nitrogen. Second, a modification of Thomas' formula that was used for data on growth will be used here and discussed. The last method is an attempt to apply Thomas' method to milk production, an adaptation of which was used by Novins (8) and Mitchell and Villegas (9) in work on growth..."

985. Horn, V., and Mühl, E. Der einfluss von nicht entfetteten und entfetteten sojabohnen auf die milcherzeugung und die butterbeschaffenheit. Biedermanns Zentralblatt, Abteilung B, Tierernährung 9(1): 1-31. 1937. 384 B47T

"Aus dem Agrikulturchemischen Institut des Landes-Universität, Giessen."

English summary, p. 31.

Study on the influence of whole and extracted soybeans on milk production and the quality of butter.

986. Hunziker, O. F., and Caldwell, R. E. Test of three protein concentrates and two leguminous roughages in milk production. Ind. Agr. Expt. Sta. Bull. 203, 20pp. Lafayette, 1917.

"The purpose of this bulletin is to offer the results of an experiment designed to give directions to feeders of dairy cows, regarding the type of protein-carrying concentrates and leguminous roughages best adapted for maximum and economical milk yield." It is found, among other things, that "the use of soybean hay caused an increase in body weight and a decrease in daily milk and butter fat production."

987. Ingham, L. W., and Meade, DeVoe. Ground versus unground soybean hay for dairy cows. Md. Agr. Expt. Sta. Bull. 316, pp. 219-229. College Park, 1929.

"This bulletin is based upon data presented by Mr. J. Z. Miller in partial fulfillment of the degree of Master of Science at the University of Maryland."

"In any comparison between ground and unground roughage the practical dairyman is primarily interested in knowing what increased yields of milk and butterfat may be secured, which manner of feeding is the more practicable and profitable, and what it costs per ton to grind roughage. The experiment herein discussed was undertaken in order to obtain data which might throw light on these and other aspects of this question."



The bulletin is also contained in Maryland Agr. Expt. Sta. Report, v. 43, pp. 219-229, 1929-30.

A summary of this experiment is given by L. W. Ingham under the title "Ground vs. unground soy bean hay," in Hoard's Dairyman 73(21): 1005. Nov. 10, 1928. 44.8 H65

988. Jacobson, C. O. A comparison of alfalfa hay and soybean hay with and without mineral and cod liver oil supplement. Assoc. South. Agr. Workers Proc. (1933-35) 34-36; 512-513. 4 C82  
Abstract of paper.  
"Definite conclusions as to the feeding value of soybean hay when compared with alfalfa cannot be drawn from the one trial but results to date would indicate that soybean hay of good quality... could be substituted for alfalfa in a growing ration for dairy heifers."
989. Kampen, G. B. van. Die Dürener krankheit. Landwirtschaftlichen Versuchs-Stationen 108(5-6): 287-304. 1929. 105.8 L23  
Nachschrift, p. 304.  
This is a description of research in the "Durener" cattle sickness, which has been found analogous to that recorded by Sir Stewart Stockman and caused by extracted soymeal.
990. Kampen, G. B. van. Voedingswaarde van geëxtraheerde veevoederstoffen. Chemisch Weekblad 26(7): 98-101. Feb. 16, 1929. 385 C42  
Describes the nutritional value of extracted cattle feed.
991. King, F. G. Ground soybeans for fattening cattle. Ind. Agr. Expt. Sta. Bull. 237, 6pp. Lafayette, 1920.  
"Analyses were made of soybeans from samples taken of the ground beans fed during a series of trials to test their feeding value. A composite sample was taken each year for three successive years. The average of the three analyses is shown in Table I, in comparison with the average analysis of cottonseed meal fed in the same tests...  
"The results of substituting ground soybeans for cottonseed meal in a ration for fattening cattle are shown in Table II, which is a summary of data secured from averaging three trials with two and three-year-old steers, with ten animals in each lot..."
992. [Lane, Clarence B.] Report of the Dairy husbandman. N. J. Agr. Expt. Sta. Ann. Rept. (1903) 24: 347-411. Somerville, N. J., 1904.  
"Sixteenth Annual Report of the New Jersey Agricultural College Experiment Station..."  
Alfalfa hay, cow pea hay and soy bean silage as substitutes for purchased feeds. Cottonseed meal versus wheat bran and dried brewers' grains, pp. 388-411, contains a section: Experiment II. Soy bean silage and alfalfa hay versus purchased feeds, pp. 396-402, which has for its purpose "to compare the value of a ration

that could readily be grown upon the farm with one in which the protein was largely supplied by feeds commonly purchased by dairy-men, namely, wheat bran, dried brewers' grains and cottonseed meal...."

The same paper, with a few minor changes, appears as New Jersey Agr. Expt. Sta. Bull. 174, 24pp. New Brunswick, 1904, under the title "Alfalfa hay, cow pea hay and soy bean silage as substitutes for purchased feeds. Cottonseed meal versus wheat bran and dried brewers' grains", by Clarence B. Lane.

993. Levine, C. O. Soy beans versus oil meal in the ration of the dairy cow. *Lingnaam Agr. Rev.* 1(2): 7-14. June 1923. 22.5 C16  
Bibliography, p. 14.

"Soy beans gave six per cent. less milk and eight per cent. more fat than did oil meal...."

994. Lindsey, J. B., Holland, E. B., and Smith, P. H. Effect of soy bean meal and soy bean oil upon the composition of milk and butter fat, and upon the consistency or body of butter. *Mass. Agr. Expt. Sta. Ann. Rept.* (1908, pt. 2) 21: 66-110. Boston, 1909. (Public Doc. No. 31.)

"This experiment is the continuation of a series designed to study the effect of different foods and food groups upon the character and composition of the product of the dairy cow."

995. Linseed meal vs. soybeans. Iowa Farmers at cattle feeders' day. *Wallaces' Farmer* 58(16): 342. Aug. 5, 1933. 6 W15  
This is the report of tests made at the Iowa State College in 1932 and 1933 under Prof. C. C. Culbertson, and exhibited at Ames before one thousand farmers on July 21.

996. Lütkefels. Die einwirkung der sojakuchen auf die milchkühe und die milch. Mischmilch mit einem abnorm niedrigen fettgehalt und deren beurteilung. *Zeitschrift für Fleisch- und Milch-Hygiene* 35(20): 316-321. July 15, 1925. 449.8 Z35

This is a discussion of the influence of soybean cake on the dairy cow and on the milk, and the cause of abnormally low fat content of mixed milk. It was found that large amounts of soybean cake in the ration tended to produce large amounts of milk with a low fat percentage.

997. McCandlish, Andrew C., and Weaver, Earl. Coconut meal, gluten feed, peanut meal, and soy bean meal as protein supplements for dairy cows. *Jour. Dairy Sci.* 5(1): 27-38. January 1922. 44.8 J822  
References, p. 38.

"The work reported here consisted of two trials of 150 days each in the first of which peanut meal and soybean meal were compared with old process linseed oil meal, while in the second trial coconut meal and gluten feed were compared with the linseed meal."



998. McCandlish, Andrew C., Weaver, Earl, and Lunde, L. A. Soybeans as a home-grown supplement for dairy cows. Iowa Agr. Expt. Sta. Bull. 204, pp. 45-52. Ames, 1922.

The results of the tests showed that "cracked soybeans, when fed with the home-grown ration mentioned, [corn silage, alfalfa hay, cracked corn and ground oats] are worth one-third more than oilmeal. The soybeans were palatable and had no deleterious effects on the animals. Consequently, it would appear that soybeans if grown more extensively, not only for seed purposes or for the purpose of adding protein to silage, would be a valuable home-grown protein supplement and would render many dairymen independent of the purchase of high-priced protein feeds. In this way it would be possible to conduct a dairy farm with the use of practically no purchased feeds."

These experiments are summarized in an anonymous article entitled "Soybeans for dairy cattle" in the Live Stock Jour. 99(2596): 9. Jan. 4, 1924. 49 L74

999. Mallèvre, A. Les expériences danoises concernant la valeur des tourteaux de soja pour l'alimentation des vaches laitières, et l'influence qu'ils exercent sur la qualité du beurre. Annales de la Science Agronomique Française et Étrangère 29(2): 83-100; (3): 226-228. February-March 1912. (4e Série - 1<sup>re</sup> Année - 1<sup>er</sup> Semestre.) 14 An75

Danish experiments on the value of soybean cake as a feed for dairy cows and its influence on the quality of butter produced.

1000. Moore, J. S., and Cowser, W. C. Soybeans for dairy cows. Miss. Agr. Expt. Sta. Bull. 235, 15pp. A. & M. College, 1926.

Gives the results of using soybean hay as compared with alfalfa hay, lespedeza hay, and laredo hay, and ground soybeans as compared with cottonseed meal and soybean meal.

1001. Nevens, W. B., and Tracy, P. H. The relation of soybean hay and ground soybeans to flavor and composition of milk and butter. Jour. Dairy Sci. 11(6): 479-487. November 1928. 44.8 J822  
References, p. 487.

"Several reports which reached the [Illinois University] Department of Dairy Husbandry during the past year stated that rations containing soybean hay or ground soybeans caused undesirable flavors in milk, cream, and butter; these products being affected to such an extent that they were not marketable or that their value was lowered...

"Experiments were therefore undertaken with the object of determining the effect of rations containing soybean hay and ground soybeans upon the flavor and composition of milk, cream, and butter."

1002. Olson, Thomas M. Soybeans for dairy cows. S. Dak. Agr. Expt. Sta. Bull. 215, 15pp. Brookings, 1925.  
Literature cited, p. 15.  
"The object of the investigations at South Dakota State College was to determine the feeding value of ground soybeans and soybean hay and to note if the ground soybeans had any deleterious effects on the butter...  
"The results indicate that ground soybeans can be fed with profit by dairy farmers for the high protein feed, and thus decrease the cost of milk production materially..." - Digest, p. 2.
1003. Perkins, A. E. Soybeans or meal for cows. Grain & Feed Jours. Consolidated 75(9): 382. Nov. 13, 1935. 298.8 G762  
Address "before feed merchants at Wooster, O."  
Relative advantages and disadvantages of soybeans and soybean meal.
1004. Price, James.N. Home-grown rations in economical production of milk and butter. Tenn. Agr. Expt. Sta. Bull. 80, pp. 31-42. Knoxville, 1908.  
"In order to demonstrate the feeding value of the soy bean and to prove the economy of a home-grown ration, the Experiment Station conducted a feeding experiment with its herd during the past winter. In the planning of this experiment two objects were kept in view: first, to compare the soy bean with other standard protein feeds, and, second, to compare the cost of producing milk and butter with home-grown and with purchased rations of approximately the same feeding value. The soy bean can be grown very successfully in all parts of Tennessee, and promises to become a leading dairy feed."
1005. Richter, K., and Herbst, J. Die einwirkung der verfütterung von holzzuckerhefe im vergleich zu sojaextraktionsschrot auf menge und fettgehalt der milch von kühen. Landwirtschaftlichen Versuchs-Stationen 121(3-4): 215-221. 1934. 105.8 L23  
"Aus dem Institut für Fütterungstechnik der Forschungsanstalt Tschechnitz, Kreis Breslau."  
This paper gives the results of feeding experiments conducted to compare the effect of feeding wood sugar yeast and extracted soybean meal upon the quantity and fat content of cows' milk.
1006. Rosengren, L. Fr. Einfluss der sojakuchen auf die beschaffenheit der butter. Milchwirtschaftliches Zentralblatt 7(2): 77-83. February 1911. 44.8 M59M  
It is concluded that soybean cake fed at the rate of 2.5 kg. per head a day did not cause any undesirable flavor in the butter or otherwise affect its quality.  
Also published in Meddelande från Centralanstalten för Forsöksväsendet på Jordbruksområdet. Stockholm, no. 30, 8pp.  
Not examined.



1007. [Rusk, H. P., and Snapp, R. R.] "Toasting" soybean oil meal lowers palatability. Ill. Agr. Expt. Sta. Ann. Rept. (1933-34) 47: 73-75. Urbana, 1935.

Tests were made "to determine the relative feeding value of soybean oil meals manufactured in different ways. The cattle making the largest gains of any in the experiment were those fed meal produced at the lowest temperature."

An earlier report entitled "Processing Method May Make Soy Oil Meal Unpalatable" appeared in Ill. Agr. Expt. Sta. Ann. Rept. (1932-33) 46: 72-74. Urbana, 1933.

1008. Samin, Vasfi. Zur kenntnis der einwirkung verschiedenartig entfetteter sojaschrote auf das blutbild des rindes. 63pp. [Berlin, 1932.] 389.7 Sa4

Inaug.-diss. - Tierärztl. hochschule, Berlin.

Literaturverzeichnis, pp. 59-61.

This study on the effect of extracted soy meal on the blood form (blutbild) of cattle, has a general section on the soybean, and describes the Durener cattle disease, and research on the blood structure of cattle.

1009. Schaeffer, O. G. Soybeans and soybean hay in the dairy ration. Minn. Agr. Expt. Sta. Bull. 239, 16pp. University Farm, St. Paul, 1927.

Bibliography, p. 16.

The study is divided into parts: For the first, Feeding the Soybean Seed, the following conclusions are reached:

"1. Linseed oilmeal proved slightly more valuable than ground soybeans for milk production, while ground soybeans proved superior for butterfat production; tho for all practical purposes one pound of ground soybeans will replace one pound of linseed oilmeal in the dairy ration. 2. Feeding the ground soybean supplement resulted uniformly in raising the percentage of butterfat in the milk. The average butterfat test for the ground soybean group was 4.01 per cent as compared to 3.82 per cent for the linseed oilmeal group."

For Part II. Feeding soybean hay, the author concludes:

"1. Soybean hay proved more palatable than timothy hay, the soybean hay consumption for the trial being 34 per cent greater. 2. Feeding soybean hay instead of timothy hay resulted in a 46 per cent saving of concentrates. 3. Feeding the low-protein timothy hay required the purchase of 53 per cent of the concentrates as compared to only 5 per cent when soybean hay was fed. 4. Feeding soybean hay instead of timothy hay reduced the expenditure for mill feeds by 93.6 per cent."

1010. Schaeffer, O. G. Soybeans cut feed cost. Dairy Farmer 26(3): 9, 22-23. March 1928. 44.8 K56

Summarizes the results of feeding experiments conducted by the University of Minnesota's dairy division to determine the value of soybean seed and soybean hay as a source of protein in the dairy ration.

1011. Seulke, K. J. Why soybean oil meal? Flour & Feed 34(10): 22-23. March 1934. 298.8 F66

"Soybean oil meal is the newest of the high protein feed ingredients. Although it has been on the market for quite a few years, its use in dairy rations has not become as prevalent as its value and importance warrant due to a number of reasons: First, because of the fact that until within the last few years the supply has not been sufficiently great to permit its year around use in commercial feeds on a large scale; second, because of its confusion with other soybean products, and third, because there are several grades of soybean oil meal on the market due to processes of manufacture and source, some of which lack decidedly in palatability. A fourth reason for restricted use of soybean oil meal and probably the greatest reason is the lack of understanding on the part of feed mixers and feeders alike as to the actual value of soybean oil meal and the part that it plays in the ration of the various classes of livestock..."

An extract of this is printed in Grain & Feed Jours. Consolidated 72(6): 262. March 28, 1934. 298.8 G762

1012. Shoptaw, LaVan Neill, Espe, D. L., and Cannon, C.Y. Gastric digestion of soybean flour. Jour. Dairy Sci. 20(3): 117-128. March 1937. 44.8 J822

"Journal Paper No. J357 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 47."

References, p. 128.

"A soybean gruel made by mixing one part of soybean flour with nine parts of water was compared with whole and skim milk for calf feeding..." - Summary, p. 128.

1013. Shoptaw, LaVan Neill. Gastric digestion of soybean flour when used as a substitute for cows' milk in feeding dairy calves. Iowa State Col. Jour. Sci. 11(1): 105-106. October 1936. 470 Io9  
"Original thesis submitted December, 1935. Doctoral thesis number 356."

The results of three series of trials are said to indicate that "Assuming that the volume of gastric secretion is in direct proportion with gastric digestion, then soybean flour, fed as in these trials, is digested in the calf's stomach at a slightly more rapid rate than either whole or skimmed cows' milk."

1014. Shoptaw, LaVan Neill. Soybean flour as a substitute for cow's milk in feeding dairy calves. Jour. Dairy Sci. 19(2): 95-99. February 1936. 44.8 J822

Literature, p. 99.

"Because of the success that was had in feeding infants on soybean milk, an experiment was planned to determine the effectiveness and economy of using soybean milk as a substitute for cow's milk in rearing dairy calves."



1015. Smethan, Alfred. Some new feeding stuffs and their relative value as cattle foods. Roy. Lancashire Agr. Soc. Jour. 1909: 28-45.  
10 L22  
Soya beans or China oil beans, pp. 29-32.
1016. Snell, M. G. Machine dried soybean hay for fattening cattle. La. Agr. Expt. Sta. Bull. 257, 18pp. Baton Rouge, 1934.  
"Literature cited", pp. 15-18.  
This is a report of the results of feeding trials to discover how the machine-dried hay compares with field-cured hay as a feed, and whether it pays.
1017. Snell, M. G. Machine dried versus field cured soybean hay for beef steers. Amer. Soc. Anim. Prod. Proc. (1932) 25: 67-69. 1933.  
389.9 Am3F  
Results of feeding trials, 1930-1931, at the Louisiana Agricultural Experiment Station. A comparison of prices is included.
1018. Le soja dans l'alimentation du bétail. L'Engrais 25(22): 613. June 3, 1910. 57.8 En7  
Reports an alleged case of poisoning of 55 cows by soybean meal.
1019. Soybean hay for the dairyman. Wallaces' Farmer 54(19): 741. May 10, 1929. 6 W15  
"When we remember that soybean hay stands as high as alfalfa as a protein roughage, and supplies protein cheaper than linseed meal, that it can easily be added to the farming program for 1929, that it is a sure crop, with no extra equipment or liming costs, and that it is highly palatable to all classes of livestock, it would seem that many farmers should avail themselves of this method of avoiding a hay shortage next winter."
1020. Stockman, Ralph. Soya meal as a cattle food. Jour. Compar. Path. and Ther. 40(4): 266-273. December 1927. 41.8 J82  
Gives the results of experiments in feeding soy meal to rabbits, in an effort to see why cattle died upon being fed soy meal from which the oil had been extracted.
1021. Stockman, Sir Stewart. Cases of poisoning in cattle by feeding on meal from soya bean after extraction of the oil. Jour. Compar. Path. and Ther. 29(2): 95-107. June 1916. 41.8 J82  
As a result of the experiments and observations conducted, it is concluded that "extracted soya meal constitutes an excellent auxiliary foodstuff for cattle but it is inadvisable to use trichlorethylene as the extractor."  
An abstract of this is printed anonymously under the title: Extracted soya meal poisoning, in Jour. Bd. Agr. [Gt. Brit.] 23(7): 691-692. October 1916. 10 G79J

1022. Takahashi, Eiji, Iguchi, Kenzo, Mitamura, Kentaro, and Shirahama, Kiyoshi. The influence of soy bean cake upon milk production and the quality of butter. 66pp. [Dairen?] Published by South Manchurian Railway co., 1934. 389.7 T13  
Bibliography, pp. 65-66.  
"An experiment was conducted upon the effects of Manchurian soy bean cake on cows. The influence of the daily amount, or of combining with other feeds, upon the quality and quantity of milk, especially on the physical and chemical properties of butter were studied..." - Conclusion, p. 64.
1023. Thomas, B. H., Culbertson, C. C., and Beard, Fred. The effect of ingesting soybeans and oils differing widely in their iodine numbers upon the firmness of beef fat. Amer. Soc. Anim. Prod. Proc. (1934) 27: 193-199. 1935. 389.9 Am3R  
"Journal Paper No. J-218 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 370."  
This is a continuation of studies reported in the 1933 Proceedings.
1024. Thomas, B. H., and Culbertson, C. C. The effect of soybeans upon the firmness of beef fat. Amer. Soc. Anim. Prod. Proc. (1933) 26: 65-70. 1934. 389.9 Am3R  
"Journal Paper No. K140 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 36."  
"...Realizing fully the softening influences of soybeans upon hogs and the penalty exacted from hog producers by the packer for marketing soft hogs, numerous farmers now are asking whether the firmness of beef is similarly influenced deleteriously by feeding large allowances of soybeans. In view of the foregoing and realizing, too, that the acreage planted to soybeans in Iowa is increasing annually, the following report of a preliminary investigation into this question is made..."
1025. Tomhave, A. E. Soybean meal and ground soybeans as protein supplements for dairy cattle. Del. Agr. Expt. Sta. Bull. 148, 19pp. Newark, 1927.  
Reference to literature, p. 19.  
"Part I of this bulletin deals with the results obtained from the feeding of soybean meal, followed in part II by the results obtained from the feeding of ground soybeans."
1026. Wiggans, R. G. Combinations of corn and soybeans for silage. N. Y. (Cornell) Agr. Expt. Sta. Bull. 634, 34pp. Ithaca, 1935.  
"Paper No. 211, Department of Plant Breeding, Cornell University, Ithaca, New York."  
References, pp. 33-34.  
"All factors considered, a combination of corn and soybeans for silage is a practice to be highly recommended to the dairymen



of New York State as a means of increasing production, improving silage, reducing the amount of concentrates necessary, and adding another legume to the cropping system, all of which tend to decrease the cost per unit of production." - Conclusions, p. 32.

1027. Wilbur, J. W., Hilton, J. H., and Hauge, S. M. The effect of soybeans in the rations of dairy cows upon the vitamin A value of butter. Jour. Dairy Sci. 18(10): 661-665. October 1935. 44.8 J822  
References, p. 665.  
Gives the results of feeding experiments.
1028. Wilbur, J. W., Hauge, S. M., and Hilton, J. H. A further study of the factor in soybeans affecting the vitamin A value of butter. Jour. Dairy Sci. 19(7): 447. July 1936.  
Abstract of paper presented at annual meeting of American Dairy Science Association.  
Study "for the purpose of determining what component part or parts of the soybean carry this action" of suppressing action on the formation of vitamin A in butter, when fed to dairy cows.
1029. Wilbur, J. W. Soybean hay. Purdue Agr. 25(8): 160, 175. May 1931. 6 P97  
Results of feeding trials "conducted with dairy cows to determine the relative feeding value of soybean plants cut at different stages of maturity for hay" at Purdue University.
1030. Wilbur, J. W. Soybeans for dairy cows increase fat in milk. Purdue Agr. 28(7): 51, 59. April 1934. 6 P97  
"E. J. McVey and W. S. Arbuckle cooperating."  
This is a summary of results of feeding trials to determine the effect of soybeans on the fat content of milk.
1031. Williams, N. K., Cannon, C. Y., and Espe, D. L. Production of dairy cows when fed only silage and cracked soybeans. Jour. Dairy Sci. 19(7): 459. July 1936.  
Abstract of paper presented at annual meeting of American Dairy Science Association.  
Experiment at Iowa State College.
1032. Wisconsin. Agricultural experiment station. Soybean hay for milk production. Wis. Agr. Expt. Sta. Ann. Rept. (1922-23) 40: 99-100. Madison, 1924. (Bull. 362)  
Results of feeding trials conducted by Morrison, Savage, and Hulce.  
Similar experiments were conducted and reported in later annual reports as follows:  
Soybeans vs. alfalfa hay for dairy cows. Wisconsin Agr. Expt. Sta. Ann. Rept. (1923-24) 41: 92. Madison, 1925. (Bull. 373)  
Experiments conducted by Morrison, Hulce, and Humphrey.

Soybeans vs. alfalfa hay for dairy cows. Wisconsin Agr. Expt. Sta. Ann. Rept. (1924-26) 42: 127-128. Madison, 1926. (Bull. 388) Experiments conducted by Morrison, Humphrey, I. W. Rupel and associates.

1033. Woll, F. W., and Humphrey, G. C. Soy bean silage as a food for dairy cows. Wis. Agr. Expt. Sta. Rept. (1904) 21: 67-74. Madison, 1904.

"The objections to soy-bean silage, which have been stated in the preceding, would not, in our experience, apply to the mixed corn-soy bean silage... According to our present experience, we may, therefore, consider this silage mixture an improvement on corn silage, in so far as it furnishes a succulent, palatable feed, containing a somewhat larger proportion of nitrogenous food materials than is found in pure corn silage."

1034. Wuyts, L. Le tourteau de soya et la qualité du beurre. L'Engrais 27(42): 1166. Oct. 18, 1912. 57.8 En7

"Journal des Sociétés Agricoles du Brabant et du Hainaut."

"When soy bean meal 2.5 kg. per head per day is fed to milk cows mixed with the other rations, the quality of the butter is neither injured in purity or in taste. When meal which contains other seeds than soy beans is fed the cows are sometimes poisoned and the butter tastes. 2.5 kg. is the max. feed of soy bean meal per head, per day." - Chem. Abs. 7: 1064. Jan.-April 1913.

### Hogs

1035. Barnett, E., and Goodell, C. J. Corn and soy beans for pork production. Miss. Agr. Expt. Sta. Circ. 49, 7pp. A. & M. College, 1923.

"Corn and soy beans are among the most valuable crops grown in Mississippi for the production of pork. From the standpoint of economy, they are the most satisfactory feeds that have been used in the finishing of spring pigs at the Mississippi Experiment Station and the results of several years' work indicate the wisdom of their more extensive propagation for this purpose."

1036. Bedonbaugh, P. G. Grazing and feeding trials with corn and soybeans for pork production. Miss. Agr. Expt. Sta. Bull. 283, 8pp. A. & M. College, 1930.

"Realizing that the use of soybeans was rapidly increasing in the State, both as a soil improver and for the production of pork, experimental work was carried out at the Mississippi Experiment Station to try to determine the most desirable variety and economical way of utilizing the beans for the production of pork. Most of the trials conducted were with the Mammoth Yellow and Laredo beans, since they were two of the leading varieties being grown in the State."



1037. Bohstedt, G., Fargo, J. M., and King, W. A. Soybean oil meal and other plant protein rations for pigs, supplemented with limestone and bone meal. Amer. Soc. Anim. Prod. Proc. (1937) 30: 107-110. 389.9 Am3R 1937.  
An account of feeding experiments at the University of Wisconsin.
1038. Bray, Charles I. Hogging down corn and green soybeans. Assoc. South. Agr. Workers Proc. (1933-35) 34-36: 111-112. [n.p., 1935?] 4 C82  
Abstract of paper.  
The writer gives the conclusions reached after two experiments conducted in 1931 and 1932 at the Louisiana Agricultural Experiment Station. Costs of hogging off corn and soybeans are included.
1039. Bull, Sleeter, Carroll, W. E., Olson, F. C., Hunt, G. E., and Longwell, J. H. Effect of soybeans and soybean oil meal on quality of pork. Ill. Agr. Expt. Sta. Bull. 366, pp. 33-80. Urbana, 1931.  
"In the spring of 1925 a series of five experiments was undertaken the purpose of which was to study the value of soybeans in the ration of market hogs and their effects on the value of the carcasses...  
"In these experiments the points primarily considered were the effect of soybeans on rate and economy of gains, on dressing percentages, on shrinkage of carcasses in the cooler, and on firmness of carcasses and cured cuts (ham and bacon). An attempt was also made to find methods by which soybeans and their principal by-product, soybean oil meal, might be fed to hogs without deleterious results."  
Statistical tables illustrate these points.
1040. Bull, Sleeter. Soybeans not guilty. Scientist says lack of finish is real culprit in soft pork indictment. Breeder's Gaz. and Dairy Trib. 97(2, whole no. 2431): 10. February 1932. 49 B74  
"It is apparent that altho soybeans produce soft pork, this should not be particularly alarming for three reasons: (1) the amount of soybeans now available for hog feeding is small and can account for only a relatively small amount of soft pork; (2) the demand for soybean oil will probably furnish a more profitable outlet for soybeans than hog feeding; and (3) the quicker, more economical gains obtained with soybean oil meal or tankage will cause the beans available for feed to be utilized for other purposes."
1041. Carmichael, B. E. Soybean pasture for fattening hogs. Md. Agr. Expt. Sta. Bull. 376, pp. 299-311. College Park, 1935.  
Report of results of an experiment to obtain information concerning the use of soybean forage for young hogs being fattened for market. Table 6 is a financial statement of the experiment.
1042. [Carroll, W. E., Smith, R. A., Bull, Sleeter, and Longwell, J. H.] Soybean test compares hogging-down vs. dry lot. Ill. Agr. Expt. Sta. Ann. Rept. 1926/27, pp. 82-84. Urbana, 1927.

An investigation "on the relative values of hay and seed types of soybeans when planted with corn for hogging-down. Also, the effect of these types of soybeans upon the quality of the resulting pork when they are hogged-down with corn..." The results of the year's work is summarized.

1043. Carter, C. E. Corn plus soys equals pigs. Country Gent. 84(49): 30. Dec. 6, 1919. 6 C833  
The writer relates the experiences of Knox County, Missouri, farmers in growing soybeans in their corn.
1044. Carter, C. E. Hogs, corn and soybeans. A good combination in Knox county, Missouri. Swine World 6(11): 7. June 1919. 46.8 Sw62  
Experiences of Knox County farmers with soybeans.
1045. Culbertson, C. C., Thomas, B. H., Beard, F. J., and Hammond, W. E. The influence of soybeans upon the gains, feed requirements, and character of the fat produced when fed to growing and fattening spring pigs on rape pasture. Iowa Agr. Expt. Sta. Anim. Husb. Leaflet 150, 6pp., processed. Ames, February 1936.  
"The data presented in this leaflet are those gathered in the fourth of a series of experiments to determine the most practical way to make use of soybeans and soybean products in Iowa's swine feeding yards." A table showing costs of 100 pounds' gain and margin per pig over feed costs is given.
1046. Dalbey, D. S. Pork production in Illinois. Ill. Agr. 6: 74-80. 1902. 6 I16  
Includes figures of increase in weight and value of hogs pastured on soybeans for a summer, pp. 78-79.
1047. Davidson, H. R. Soy beans make soft pork. Swine World 23: 5. January 1937. 46.8 Sw62  
Not examined.
1048. Davis, Russell S. Soybeans increase farm efficiency. Breeder's Gaz. 79(18, whole no. 2055): 816. May 5, 1921. 49 B74  
"Soybeans furnish the stock-farmer with one practical means of increasing his farm's efficiency. Their value for pork production was well demonstrated by the following experiment..." Feeding tests made by the Purdue University Experiment Station are also cited.
1049. Ferrin, E. F. Expeller processed soybean oil meal compared with other protein supplements. Amer. Soc. Anim. Prod. Proc. (1935) 28: 104-106. 1936. 389.9 An3R  
Gives the results of two experiments with hogs, conducted at the Minnesota Station.



1050. Ferrin, E. F., and Johnson, Don. The soybean and its relation to soft pork. Amer. Hampshire Herdsman 8(10): 16. October 1933. 46.8 Am33  
The difficulty of marketing soft pork produced by soybeans is pointed out. Soybean oilmeal, however, was proved satisfactory.
1051. Ferrin, E. F. Soybeans as a part of the protein supplement for growing pigs. Swine World 21(7): 7. June 1934. 46.8 Sw62  
This is a summary of the results of feeding experiments at the [University of Minnesota?] Station, in the summer of 1931.
1052. Flint, P. N. Spanish peanuts, soy beans and skim milk as feeds supplementary to corn. Ga. Agr. Expt. Sta. Bull. 87, 10pp. Experiment, 1909.  
The results of an experiment in feeding Spanish peanuts, soybeans and skim milk to pigs as a supplement to corn. A financial statement of the experiment is included, as well as the costs of seeding and cultivating one acre of soybeans and one acre of Spanish peanuts.
1053. Glassmann, B., and Gologorskaja, S. Verdauungsversuche an milch und sojanährpräparaten. Zeitschrift für Untersuchung der Lebensmittel 72(5-6): 450-452. November-December 1936. 384 Z39  
"Artificial digestion expts. were made with soy sour cream, soy 'quarg', soy protein (Tophu), cow milk sour cream and milk 'quarg.' The digestibilities of the first were 2-3 times greater than that of the sour cream from cow milk, but the digestibilities of the other products were about the same. Without the addn. of some material to better the flavor, the soy, preps. would be difficult to use." Chem. Abs. 31(16): 5886. Aug. 20, 1937.
1054. Godbey, E. G., Kyzer, E. D., and Clyburn, T. M. Green soybeans, alfalfa, and permanent pastures as forages for fattening hogs. S. C. Agr. Expt. Sta. Bull. 289, 16pp. Clemson College, 1933.  
"The objects of these experiments were - 1. To compare full feeding of corn and fishmeal in dry lot with limited and full feeding of corn and corn and fishmeal to hogs grazing green soybeans. 2. To compare alfalfa and permanent pasture and green soybeans as forages for fattening hogs receiving corn and fishmeal free-choice. 3. To compare Biloxi and Oteotan soybeans as green forages for fattening hogs. 4. To determine the effect of these rations on the hardness of fat produced."
1055. Godbey, E. G., and DuRant, A. L. Protein supplements to corn in dry lot for fattening pigs. S. C. Agr. Expt. Sta. Bull. 234, 14pp. Clemson College, 1926.  
"The following tests were conducted to determine the relative efficiency of these by-products, soybean oil meal and peanut feed, and the older well established protein supplements, tankage and fish meal..."

1056. Godbey, E. G. Rations for fattening hogs on soybean forage. S. C. Agr. Expt. Sta. Bull. 274, 15pp. Clemson College, 1931.  
"The objects of these experiments were:  
(1) To compare full feeding of corn and tankage in dry lot with limited and full feeding of corn and of corn and tankage to hogs grazing soybeans.  
(2) To determine the effect of these rations on the hardness of fat."
1057. Godbey, E. G., and DuRant, A. L. Soybean forage for hogs. S. C. Agr. Expt. Sta. Bull. 228, 15pp. Clemson College, 1926.  
"The high price of corn and tankage makes the cost of producing pork on this ration very high. The acreage planted to soybeans in South Carolina has increased rapidly, both as a hay crop and for forage. The series of tests reported in this bulletin was planned to determine the value of this crop as a forage for hogs. The results given were obtained from experiments conducted on soft pork in cooperation with other Southern experiment stations and the United States Department of Agriculture. Only the feeding value of soybean forage is reported in this publication; no reference is made to the quality of pork produced..." - Introduction.
1058. Good, Edwin S., and Mann, L. B. An experiment comparing velvet bean meal, tankage and soy bean meal as supplements to corn meal in feeding hogs. Ky. Agr. Expt. Sta. Circ. 20, 4pp. Lexington, 1918.  
"This experiment again emphasizes the value of soy beans as a supplement to corn in the growing and fattening of hogs, for the results of the lot receiving soy beans in its ration compared very favorably with those of the lot receiving tankage. Soy beans can, to a large extent, take the place of tankage in swine feeding operations and, as the best grades of tankage are now retailing at about \$100.00 per ton, one can well understand the great economic importance of the soy bean."
1059. Good, Edwin S., and Smith, Mark J. Hogging down soy beans and cowpeas. Ky. Agr. Expt. Sta. Bull. 201, pp. 139-149. Lexington, 1916.  
"The object of this experiment, the results of which are given in this bulletin, was to determine the relative amounts of gain, as well as the economy of gains, made by pigs hogging down soy beans, with and without a supplementary ration of corn, and when hogging down cowpeas with a supplementary corn ration."
1060. Gray, Dan T. Soybean pastures for hogs. N. C. Agr. Col. Ext. Circ. 85, 8pp. Raleigh and West Raleigh, 1919.  
"Reprint and revision of Experiment Station circular no. 24."  
The value of soybean pasture, carrying capacity of each acre of soybeans, and pounds of pork made on each acre, are discussed.



1061. Grimes, J. C., Sewell, W. E., and Taylor, W. C. Soybean hay as a supplement to white corn and tankage for growing and fattening hogs. Ala. Agr. Expt. Sta. Ann. Rept. (1929) 40: 13-14; (1930) 41: 25; (1931) 42: 22-23. Auburn, 1929-1931.  
Progress reports of feeding trials. The second and third reports are for work done by J. C. Grimes and W. E. Sewell.
1062. Hankins, O. G. Pork firmness is modified by feed and other factors. U. S. Dept. Agr. Yearbook, 1930: 415-418. Washington, D. C., 1930.  
1 Ag84Y  
Soybeans as a cause of soft pork are mentioned.
1063. Haselhoff, Emil. Schweinemastversuche mit sojabohnenmehl. Fühling's Landwirtschaftliche Zeitung 61(12): 401-414. June 15, 1912. 18 F95  
"This is a report of experiments with 36 pigs, testing the feeding value of soy-bean meal as compared with other concentrated feeds..." - Expt. Sta. Rec. 29: 371. 1913.
1064. Hays, Frank A. Swine production in Delaware. Del. Agr. Expt. Sta. Bull. 124, 43pp. Newark, 1919.  
Experiment VI, Soy Bean Forage for Fattening Growing Pigs, pp. 38-39, gives a table of results which includes such information as pork produced with one acre of soybeans with grain, value of pork produced on one acre soybean forage, and returns from one acre of soybean forage.
1065. Hayward, J. W., Bohstedt, G., and Fargo, J. M. Soybean oil meals prepared at different temperatures as feed for pigs. Amer. Soc. Anim. Prod. Proc. (1934) 27: 123-126. 1935. 389.9 Am3R  
References cited, p. 126.  
"In our experiments we are attempting to determine the effect that the temperature of oil extraction has upon the relative efficiency of the protein of soybean oil meal...  
"It is the purpose of this paper to make a brief progress report on two hog feeding experiments which were conducted by the University of Wisconsin Experiment Station..."
1066. Helmrich, F. H. Feeding of soybeans to hogs in definite proportions and their effect upon the quality of pork.. Amer. Soc. Anim. Prod. Proc. (1928): 105-106. 1929. 389.9 Am3R  
"The South Dakota Experiment Station has completed two years experimental work and an additional year's work has been completed at Ohio State, toward the writer's graduate study. The object of the trials was to find in what proportions soybeans could be fed with corn without affecting the quality of the pork; likewise, the influence of the hog's age and length of feeding period upon the pork produced."

1067. Horn, V., Weber, J., and Jungermann, K. Die fütterung nicht entfetteter sojabohnen an mastschweine. Biedermanns Zentralblatt, Abteilung B: Tierernährung 7(2): 131-140. April 1935. 384 B47T  
"Aus dem Agrikulturchemischen Institut der Landes-Universität Giessen."  
Literaturverzeichnis, pp. 139-140.  
Summary in English.  
Experiments in the feeding of whole soybeans to fattening pigs.
1068. Horn, V., and Mühl, E. Fütterungsversuche mit rohen und gekochten sojabohnen bei mastschweinen. Biedermanns Zentralblatt, Abteilung B: Tierernährung 8(3): 230-237. 1936. 384 B47T  
"Aus dem Agrikulturchemischen Institut der Landesuniversität Giessen."  
English summary, p. 237.  
Gives the results of feeding trials with hog rations of raw and cooked soybeans.
1069. Hostetler, Earl H. Soybean oil meal for fattening pigs. N. C. Agr. Expt. Sta. Bull. 259, 12pp. Raleigh. 1928.  
"There were two main objects in view at the time this work was begun. First, it was desired to compare soybean oil meal with fish meal as to its value as a protein supplement when fed with corn to fattening pigs. Second, data were needed with reference to the practicability of producing and fattening pigs, in the blackland section of the State, in numbers sufficient to make a car load or more." - p. 3.
1070. Humphrey, George C. Soy beans vs. middlings as a supplement to corn meal for fattening pigs. Wis. Agr. Expt. Sta. Rept. (1904) 21: 32-40; (1905) 22: 21-30; (1906) 23: 33-41. Madison, 1904-1906.  
The third article is by George C. Humphrey and J. G. Fuller.  
These are the reports of three trials, which are summarized as follows:  
"Soy bean meal makes an excellent supplement to corn meal for growing and fattening pigs.  
"Soy bean meal is from 8 to 10 per cent more valuable than wheat middlings for economical pork production when the cost of the two feeds is the same.  
"Soy bean meal mixed with corn meal in the proportion of 1:2, produces greater gains than wheat middlings and corn meal fed in the same proportion.  
"In feeding equal amounts of the two rations, soy beans and corn meal supply a slightly higher per cent of dry matter and digestible matter than wheat middlings and corn meal.  
"For firmness, fine grain and texture of flesh, and even distribution of fat and lean, the ration of wheat middlings and corn meal is superior to that of soy beans and corn meal."



1071. Illinois Farmers' institute. The soy bean. Ill. Farmers' Inst. Ann. Rept. (1915) 20: 252-253. 4 I162  
The value of the crop and costs of producing pork with soybeans are brought out.
1072. Jordan, Sam. The soy bean a husky ally. But you've got to know how to handle him. Country Gent. 83(28): 7. July 13, 1918. 6 C833  
"A bunch of hogs so helped a man in Carroll County, Missouri, that his corn and soy beans made him \$104 an acre, the hogs doing a big part of the labor..."  
The value of soybeans in farming is brought out.
1073. Kellner, O., and Neumann, R. Fütterungsversuche mit schweinen über die verdaulichkeit getrockneter kartoffeln und des entfetteten sojabohnenmehls. Landwirtschaftlichen Versuchs-Stationen 73(1-3): 235-240. 1910. 105.8 L23  
The writer describes digestion experiments with swine using dried potatoes and fat-free soybean meal. The average digestion coefficients of each feed are given.
1074. Kelsey, Ray T. Will soys replace tankage? Purdue trials show economy of soybean ration. Ohio Farmer 152(15, whole no. 3945): 346. Oct. 13, 1923. 6 Oh3  
Results of hog feeding tests made at Purdue University Experiment Station.
1075. Krueck, W. B. Soybeans with oil extracted produce quality pork. Grain & Feed Jours. Consolidated 69(10): 476. Nov. 23, 1932. 298.8 G762  
Value and economy of using soybean oil meal for hogs.
1076. M., I. J. Hog grower's delight. Successful Farming 19(1): 88-89. January 1920. 6 Sul2  
The writer quotes J. M. Ballard's answers to his question as to how he liked soybeans.
1077. Martin, Edgar. Use of forage crops for growing and fattening swine. Ark. Agr. Expt. Sta. Bull. 321, 32pp. Fayetteville, 1935.  
Literature cited, p. 32.  
"Since available experimental data concerning the uses of forage crops as supplemental feeds were limited, work was begun in 1926 to determine the feeding value for swine. The pasture crops used in this experiment were blue grass, winter and spring oats, wheat, barley, rye, rape, turnips, soybeans, and cowpeas..."
1078. Mathews, I. J. Soybean facts for winter. Successful Farming 19(1): 26, 47. January 1920. 6 Sul2  
The writer describes soybeans as a "wonder crop" and discusses their place in the hog's ration.

1079. Mathews, I. J. Soybeans will balance the hog ration. Successful Farming 23(3): 70. March 1925. 6 Sul2  
"The case being as above stated, there is no alibi now for sending expensively produced pork to market for want of protein to balance up the corn in the ration. Every farm upon which soybeans can be produced is capable of sending cheap pork to market."
1080. Miller, K. C. Soybeans feeding tests. Show varying results. Purdue Agr. 28(6): 47, 51. March 1934. 6 P97  
This is a description of results obtained at the Purdue Experiment station in feeding soybeans to hogs, and of tests conducted in 1932-33 by the Purdue Experiment Station in cooperation with Kingan and Company of Indianapolis to "determine the effect of soybeans and soybean oilmeal on the quality of pork."
1081. Morison, A. T. Soy succotash for hogs. Country Gent. 82(47): 1846. Nov. 24, 1917. 6 C833  
Methods used by Fayette county, Indiana, farmers in growing soybeans as a supplement to corn for hogs, and the results obtained are discussed.
1082. Mullen, Frank E. Soy beans in the Corn Belt. "Corn, soybeans and hogs" is a good slogan to assure more profit; a particularly successful combination for hogging-down purposes. Swine World 9(17): 7-8. April 1922. 46.8 Sw62  
"...this article is intended primarily to show the value of soy beans in pork production."
1083. Results of tests at Ames. Soybeans in hog rations make soft pork. Wallaces' Farmer 60(4): 89. Feb. 16, 1935. 6 W15  
"How to use soybeans and soybean oil meal in feeding market hogs was the main discussion in the Swine Feeders' Meeting held during the Iowa State College Farm and Home Week, February 4 to 8. The experiment conducted by C. C. Culbertson, B. H. Thomas, W. E. Hammond and F. J. Beard directed toward this end was the third year's work on this subject."
1084. Robison, W. L. Comparison of soybean oilmeals for supplementing corn for hogs. Ohio Agr. Expt. Sta. Monthly Bull. 9(9-10, whole nos. 105-106): 145-149. Wooster, September-October 1924.  
"Because of the marked differences in results secured from feeding soybean oilmeal from different sources in various experiments, an experiment was conducted to determine the relative values of soybean oilmeals made by the processes described and to compare their worth with that of soybeans and tankage for supplementing corn." - p. 145.



1085. Robison, W. L. Cooking soybeans for hogs. Ohio Farmer 150(25, whole no. 3902): 652-653. Dec. 16, 1922.  
The author refers to tests in feeding pigs made at the Ohio Agricultural Experiment Station.
1086. Robison, W. L. "Hogging" soybeans and corn. Breeder's Gaz. 87(21, whole no. 2267): 579. May 21, 1925. 49 B74  
Tables show influence of soybeans in checked and in drilled corn on the yields secured.
1087. Robison, W. L. Soybean oilmeal as a feed for swine. Comparisons with soybeans, linseed oilmeal, and tankage. Ohio. Agr. Expt. Sta. Monthly Bull. 5(4, whole no. 52): 114-120. April 1920.  
Includes the following tables the subject matter of which is discussed in the text: I. Tankage and soybeans as supplements to corn; II. Comparison of tankage, soybean oilmeal and ground soybeans for supplementing corn; III. Comparison of tankage, soybean oilmeal and soybeans as supplements to corn for self feeding in dry lot; IV. Comparison of Linseed oilmeal and soybean oilmeal for supplementing corn in dry lot feeding; V. Tankage, soybean oil meal and soybeans as supplements to corn for feeding on forage.  
An abstract of this article is published under the title "Soybeans and soybean oilmeal for swine" in the Breeder's Gaz. 77(16, whole no. 2001): 1036-1037. April 15, 1920. 49 B74
1088. Robison, W. L. Soybean oilmeal as a protein. Method of oil extraction effects meal as hog feed. Ohio Farmer 155(6, whole no. 4014): 162-163. Feb. 7, 1925. 6 Oh3  
Results of experiments in feeding soybean oilmeal to hogs at the Ohio Agricultural Experiment Station.
1089. Robison, W. L. Soybean, soybean oilmeal, and soft pork. Flour & Feed 36(6): 10-11. November 1935. 298.8 F66  
A summary of experiments carried out chiefly by the Ohio Agricultural Experiment Station on the use of soybeans and soybean oilmeal in hog rations.
1090. Robison, W. L. Soybeans and soybean oilmeal as supplements to corn for hogs. Amer. Soc. Anim. Prod. Proc. (1921): 48-54. 389.9 An3R  
"Soybeans doubtless deserve a place on a great many farms for some purposes, especially under certain soil and climatic conditions. For the feeding of hogs the beans themselves, however, are not an adequate supplement to corn and should not be relied upon to take the place of tankage or similar feeds. Soybean oilmeal, however, or beans from which the oil has been extracted, is a valuable source of protein."
1091. Robison, W. L. Soybeans and soybean oilmeal for pigs. Ohio Agr. Expt. Sta. Bull. 452, 42pp. Wooster, 1930.

The author discusses the results of experiments with soybeans "to determine their worth when fed in various ways and to secure information concerning methods of utilizing them advantageously as a feed for pigs." He includes numerous tables illustrating the results.

1092. Robison, W. L. Soybeans and soybean oilmeal for pigs. Cooked soybeans provide an efficient home-grown supplement when suitable minerals are supplied. Ohio Agr. Expt. Sta. Monthly Bull. 8(9-10, whole nos. 93-94): 149-153. Wooster, September-October 1923.

"Although Bulletin 349 and the Monthly Bulletin for April, 1920 as well as earlier publications issued by the Station contain reports of experiments in which soybeans were compared with other high-protein feeds as a supplement to corn for fattening pigs, increased production and a growing interest in the value of the crop for feeding purposes would seem to warrant a review of the findings of the early experiments and a presentation of the results of more recent trials, particularly those that suggest methods by which this crop may be utilized to better advantage." - p. 149.

1093. Robison, W. L. Soybeans for feeding hogs. Breeder's Gaz. 85(17, whole no. 2211): 524. Apr. 24, 1924. 49 B74

Results of experiments at the Ohio Experiment Station are briefly summarized, with emphasis on the financial aspects of the question.

1094. Robison, W. L. Soy beans for hogs. Pa. Stockman and Farmer 51(40): 858-859. Dec. 17, 1927. 6 N21

Gives the results of experiments in feeding soybeans to swine in various ways, mentions soybeans as a cause of soft pork, and suggests that "soy beans that are suitable for seed have always been worth more for that purpose than for swine feeding."

1095. Robison, W. L. Soybeans in corn for hogging-down. Prove less effective than tankage for supplementing standing corn. Ohio Agr. Expt. Sta. Monthly Bull. 9(5-6, whole no. 101-102): 75-80. Wooster, May-June 1924.

This is a summary of data obtained in experiments at the Ohio Experiment Station, Ohio State University, and the Missouri, Indiana and Iowa Experiment Stations.

1096. Robison, W. L. Supplements to corn for fattening swine. Ohio Agr. Expt. Sta. Bull. 349, pp. 131-183. Wooster, 1921.

The comparative feeding values of supplements, including soybeans, are reported.

1097. Roquemore, Everett E. Feeding whole soybeans causes soft pork. Grain & Feed Jours. Consolidated 71(2): 77. July 26, 1933. 298.8 G762

The great financial loss to farmers through soft pork due to feeding whole soybeans, is emphasized.



1098. Rowe, C. A. Pigs + corn + soybeans + clover = ? Ill. Farmers' Inst. Ann. Rept. (1912) 17: 367-369.  
The talk is chiefly on the feeding of soybeans to hogs, the weight per acre of soybeans gained, and the best way of using the crop in hog feeding.
1099. Schmidt, J., Schleinitz, Frein v., and Lagneau, E. Versuche über den stickstoffansatz von wachsenden schweinen bei fütterung mit trockenhefe, sojaschrot und erdnusskuchennmehl. Biedermanns Zentralblatt, Abteilung B: Tierernährung 6(4-5): 281-291. September 1934. 389 B47T  
Summary in English, p. 291.  
"By metabolism trials with improved country pigs of 5 different stages of life the effect of dried yeast, ground soybeans and ground peanut cakes upon deposition of nitrogenum was examined..."
1100. Shrewsbury, Charles L., Vestal, Claude M., and Hauge, Sigfred M. Effect of yeast and casein supplements to corn and soybean rations when fed to rats and swine. U. S. Dept. Agr. Jour. Agr. Research 44(3): 267-274. Washington, D. C., Feb. 1, 1932. 1 Ag84J  
"Literature cited", p. 274.
1101. Shrewsbury, Charles L., and Vestal, Claude M. The nutritive value and mineral deficiencies of soybeans. Ind. Agr. Expt. Sta. Bull. 420, 25pp. Lafayette, 1937.  
Bibliography, p. 25.  
"This report deals with certain nutritive properties of soybeans and soybean-oil meal as determined by feeding experiments with swine and rats."
1102. Simpson, F. M. Soft pork from the market standpoint. Amer. Soc. Anim. Prod. Proc. (1931) 24: 289-291. 1932. 389.9 Am3R  
"These records [kept by Swift and Co.] show at some plants a very large increase in the amount of soft pork. We believe this is due in great part - we do not know how much - to soybeans..."
1103. Skinner, J. H. Soy beans, middlings and tankage, as supplemental feeds in pork production. Ind. Agr. Expt. Sta. Bull. 108, pp. 13-32. Lafayette, 1905.  
The objects of the test were: 1. "to determine the value of soy beans as a supplement to corn in pork production and to encourage farmers to grow their own protein for hogs. 2. To compare soy beans with middlings and tankage as supplements to corn, and add new data to previous experiments with these feeds. 3. To emphasize again the deficiency of corn as a sole ration for pork production and point out more economical methods of feeding and utilizing corn."
1104. Skinner, J. H., and Cochel, W. A. Supplements to corn for fattening hogs in dry lot. Ind. Agr. Expt. Sta. Bull. 126, pp. 141-159. Lafayette, 1908.

Part II. A comparison of soy bean meal and linseed meal. In these tests it was found that "corn meal and soy bean meal proved to be a more efficient ration in the tests reported than corn meal and linseed meal, both as regards the rate and cost of gains." A table, p. 159, summarizes the experiments to determine the relative value of linseed meal and soybean meal.

1105. Smith, William C. Soy bean in the Corn Belt. It's the gilt-edge insurance of profits from pigs. Country Gent. 87(12): 4. Apr. 29, 1922. 6 C833

"This is one of a series of articles...for the purpose of suggesting to farmers ways of increasing their income." - Note.

The author feels that "for the next few years the solution of the Corn Belt farmer's financial troubles will be found in the hog...But fed with corn alone he is not the money-maker he is when corn supplemented with feeds that furnish the protein is fed.

"Experiments prove that soy beans and rape are the supplements..."

1106. Soy beans versus rape with corn. Wallaces' Farmer 48(19): 725. May 11, 1923. 6 W15

This is a report of the experiments made in 1922 by the Ohio Experiment Station comparing soybeans with rape for hogging down with corn. W. L. Robison was in charge of the experiments.

1107. Spillman, W. J. A successful hog and seed-corn farm. U. S. Dept. Agr. Farmers' Bull. 272, 16pp. Washington, D. C., 1906. 1 Ag84F

A passage, p. 13, points out that an acre of soybeans will produce 600 pounds' increase in live weight of hogs.

1108. Suzuki, Kozo. [Soy-bean cake for the fattening of swine.] Agr. Chem. Soc. Japan Jour. 6(11, whole no. 74): 975-986. November 1930. J385 Ag8

"Soy-bean oil cake as 20 and 30% was added to a feed consisting of korean 47, maize 30, bone powder 2 and NaCl 1%. The nutritive value of the feed with soy-bean oil cake was as good as that with fish meal. The results in fattening were rather superior. Vitamin A, Cl, Na and Ca should be supplied." - Chem. Abs. 25(12): 3036. June 20, 1931.

1109. Thompson, Arthur T. Why soybeans make flabby bacon. Wallaces' Farmer 56(33): 925, 929. Aug. 15, 1931. 6 W15

This article is a discussion of the results of experiments brought out in Ill. Agr. Expt. Sta. Bull. 366: "Effect of soybeans and soybean oil meal on quality of pork", and feeding trials at other state experiment stations. The writer concludes that "if corn belt men continue to grow soybeans and if they wish to use beans to advantage as hog feed, then it seems that their best bet is soybean oil meal. Those who persist in feeding whole or ground soybeans to fattening hogs are headed for trouble."



1110. Tomhave, A. E. Soybeans as a protein supplement to corn for fattening pigs on forage. Del. Agr. Expt. Sta. Bull. 170, 23pp. Newark, 1931.  
Bibliography, pp. 22-23.  
Gives the results of four experiments conducted from 1926 to 1929.
1111. Tomhave, A. E. Wheat and soybeans as a feed for swine. Amer. Soc. Anim. Prod. Proc. (1932) 25: 131-133. 1933. 389.9 Am3R  
"For three years there have been tests in progress at the Delaware Experiment Station to determine the value of wheat and soybeans as a feed for fattening hogs. The results obtained from the trials conducted during the past two years will be presented here."
1112. Union of South Africa. Department of agriculture. Cowpeas versus soya beans for pigs. Union So. Africa Dept. Agr. Jour. 7(1): 13-14. July 1923. 24 Un3  
Gives the results of a feeding trial at Cedara. Superior results were obtained from soybeans.
1113. Vestal, Claude M., and Shrewsbury, Charles L. The effect of soybeans, soybean oil meal, and tankage on the quality of pork. Ind. Agr. Expt. Sta. Bull. 400, 47pp. Lafayette, 1935.  
"The quality of either fresh or cured pork from hogs fed corn and soybeans may be as satisfactory as that from similar hogs fed corn and tankage, or corn and soybean oil meal, provided certain definite restrictions are placed on the feeding of the soybeans...  
"If the above precautions are not taken in the feeding of soybeans, hog raisers are liable to produce pork that is unsatisfactory both to the packer and to the consumer."
1114. Vestal, Claude M., and Shrewsbury, Charles L. The effects of soybeans and soybean products on pork quality. Amer. Soc. Anim. Prod. Proc. (1933) 26: 151-154. 1934. 389.9 Am3R  
References cited, p. 154.  
"The purpose of this paper is to present the results of some recent experiments at the Purdue Station on the effects of soybeans and soybean oil meal on the quality of pork."
1115. Vestal, Claude M., and Shrewsbury, Charles L. The nutritive value of soybeans with preliminary observations on the quality of pork produced. Amer. Soc. Anim. Prod. Proc. (1932) 25: 127-130. 1933. 389.9 Am3R  
"The nutritive value of cooked and roasted soybeans was superior to raw soybeans in combination with yellow corn and minerals for rats and swine. 2. Soybeans whether raw, cooked, or roasted had a definite softening effect on the carcasses of hogs. 3. The quality of the cured and smoked hams and bacons from hogs fed soybeans was satisfactory from the commercial standpoint." - Summary, p. 130.

1116. Vestal, Claude M. Soft pork - cornbelt. Amer. Soc. Anim. Prod. Proc. 1925-26: 75-77. 1927. 389.9 Am3R  
Soybeans are cited as a reason for soft pork in the Corn Belt, and soft pork studies in that section are said to rightly center around them.
1117. Vestal, Claude M. Soybean and mineral supplements for fattening hogs. Swine World 10(3): 18, 19. Sept. 5, 1922. 46.8 Sw62  
Gives the results of feeding trials at Purdue University.  
This is a progress report. Similar tests are to follow.
1118. Vestal, Claude M. Soybeans as a substitute for tankage in fattening spring pigs on legume pasture. Ind. Agr. Expt. Sta. Bull. 341, 14pp. Lafayette, 1930.  
"Will soybeans prove as valuable as tankage in fattening spring pigs for early market? In 1922, a series of experiments was begun with the purpose of obtaining an answer to this question. The description and results of these experiments, covering six consecutive years, are given in this bulletin."  
Supplementary report on feeding soybeans to hogs, pp. 11-14. It is concluded that "soybeans should be used more extensively in rations for fattening hogs to conserve the tankage, fish meal, milk and other protein-rich feeds for the brood sows and young growing pigs. If this recommendation were followed throughout the corn belt, the problem of obtaining an adequate supply of cheap protein concentrates would be less acute and production costs would be lower for the swine industry."
1119. Weaver, L. A. Hogging down corn and soybeans. Mo. Agr. Expt. Sta. Bull. 224, 20pp. Columbia, 1924.  
"This bulletin reports a five-year investigation of the pork producing value of corn and soybeans planted together and hogged down. The harvesting of duplicate plots also made it possible to compute the yield of corn and beans consumed in each lot. The combination produced more pork per acre than corn alone but not so much as corn supplemented with tankage. A mineral mixture was added to the corn and soybeans in one year's feeding test and gave results superior to those from corn and soybeans not thus supplemented, but still inferior to the results from corn, soybeans and tankage." - Abstract, p. 3.
1120. Weaver, L. A. Soybeans and soybean oil meal in swine rations. Mo. Agr. Expt. Sta. Bull. 266, 20pp. Columbia, 1929.  
"This bulletin reports the results of two investigations made with a view of finding methods of feeding which will give maximum returns from the use of soybeans and soybean oil meal when used to supplement corn fed fattening hogs on pasture..." - Abstract, p. 3.
1121. Zeller, J. H., and Hankins, O. G. Pork of good quality grown efficiently on corn-soybean ration. U. S. Dept. Agr. Yearbook, 1934, pp. 290-292. Washington, D. C., 1934. 1 Ag84Y



"In cooperation with the Purdue (Ind.) University Agricultural Experiment Station, the Department has conducted a series of tests to determine the maximum proportion of soybeans that may be fed to hogs with corn without serious detriment to the quality of carcass."

### Horses and Mules

1122. Belden, L. A. Soybean hay for horses. Purdue Agr. 23(7): 168, 180-181. April 1929. 6 F97

Article based on a bulletin published by the University of Illinois "containing the experience and opinions of farmers who were successfully feeding soybeans to horses and mules."

"The entire problem summarized indicates that soybean hay, corn and oats makes satisfactory feed for farm work horses. Soybean straw is an excellent roughage for wintering idle horses and mules. No bad results from feeding soybeans in any form were reported by any of the farmers questioned."

1123. Crawford, C. W., and Edmonds, J. L. Soybeans for horses and mules. Ill. Agr. Expt. Sta. Circ. 276, 8pp. Urbana, 1924.

"A number of farmers in central Illinois have found rations of soybean hay and corn or soybean hay, corn, and oats to be very satisfactory for feeding work horses... Soybean straw has been found to be a very satisfactory roughage for wintering idle work horses and mules...A small amount of beans fed in the spring seemed to aid in getting a horse's hair smooth and sleek. Soybean hay has been found to be an excellent roughage for fattening mules. Mules fed on this hay finished with exceptionally smooth coats of hair. Fattening mules also gained well on soybean pasture..." - Summary, p. 2.

1124. Edmonds, J. L., and Crawford, C. W. Soybean hay and sweet-clover pasture for growing purebred draft fillies. Ill. Agr. Expt. Sta. Bull. 292, pp. 485-500. Urbana, 1927.

"The results of this experiment indicate that soybean hay when properly supplemented is a satisfactory roughage for growing draft fillies. In fact, a comparison with previous experiments indicates that it is equal to alfalfa for this purpose..."

1125. Listovnich, U. I., and Gului, M. F. [Nitrogen metabolism in soybean feeding of horses.] Ukrain's'kiĭ Biochemichnii Zhurnal Jour. 7(1): 153-161. 1934.

In Russian. Summary in English.

Not examined.

"A soybean diet leads to an increased nitrogen metabolism..." - Chem. Abs. 29(14): 4804. July 20, 1935.

Poultry

1126. Babcock, Sidney H., Jr., and Jukes, Thomas H. Beneficial effect of non-saponifiable fraction of soy bean oil on chicks fed a simplified diet. Soc. Expt. Biol. and Med. Proc. 36(5): 720-721. June 1937.  
442.9 Sol  
The non-saponifiable fraction of soybean oil was found to give protection against "nutritional encephalomalacia."
1127. Byerly, T. C., Titus, H. W., Ellis, N. R., and Nestler, R. B. Effects of light, soybean and other diet supplements on seasonal hatchability and egg production. Poultry Sci. 16(5): 322-330. September 1937.  
47.8 Am33P  
References, p. 330.  
It is stated among the conclusions that "Expeller process soybean meal made from the Illini soybean is deficient in some factor necessary for hatchability....  
"These results indicate that the Illini bean may be intermediate in deficiency between the highly unsatisfactory Mammoth Yellow variety and the fairly adequate Wilson variety used in former experiments."
1128. [Coombes, A. I., Elvehjen, C. A., Phillips, P. H., and Hart, E. B.] Soybean oil prevents one type of chick paralysis. Wis. Agr. Expt. Sta. Ann. Rept. (1937, Pt. I) 54: 8. Madison (Bull. 439)  
Soybean oil has been found to be excellent protection against the form of chick paralysis called encephalomalacia.
1129. Delmas, F. Alimentation des volailles avec la farine de soja. La Vie Agricole et Rurale 23(13): 237-238. April 1, 1934. 14 V67  
Bibliography, p. 238.  
This is the result of feeding experiments on poultry with soy meal.
1130. Gutowska, M. S., and Drescher, I. [Comparative nutritive values of soybean meal and meat and bone meal of Polish origin in the starting ration of chicks.] Polish Agr. and Forestry. Ann. 36: 115-125. 1936. 20.5 R59  
English Abstract, p. 126.  
Not examined.
1131. Hayward, J. W., Halpin, J. G., Holmes, C. E., Bohstedt, G., and Hart, E. B. Soybean oil meal prepared at different temperatures as a feed for poultry. Poultry Sci. 16(1): 3-14. January 1937.  
47.8 Am33P  
"These studies were made possible by a fellowship supported by Allied Mills, Inc., Chicago, Ill....Published with the permission of the Director of the Wisconsin Agricultural Experiment Station." - Note.  
References, p. 14.  
Gives the results of two series of feeding experiments.



1132. Horvath, A. A. Changes in hen's blood produced by a diet of sprouted soy beans. Amer. Jour. Physiol. 94(1): 65-68. July 1, 1930.  
447.8 An3  
Bibliography, pp. 67-68.  
Results of blood tests after hens were fed sprouted soybeans for a period of forty days. Clotting ability, uric acid content, gout symptoms, and globulin: albumin ratio of the blood serum, are noted.
1133. Hunter, J. E. Soy meal and gluten meal for turkeys. Grain & Feed Jours. Consolidated 75(9): 385-386. Nov. 13, 1935. 298.8 G762  
Address before Pennsylvania Millers and Feed Dealers Association.  
Feeding experiments at Pennsylvania State College.
1134. Indiana. Agricultural experiment station. Thirty-fifth annual report of the Purdue University Agricultural Experiment Station...for the year ending June 30, 1922. 67pp. Lafayette, 1922.  
In a brief report, pp. 39-40, entitled "Can soybean oil meal be substituted for tankage?" the results of tests used in feeding poultry are given.
1135. Kaupp, B. F. The value of soybean meal as a feed for chicks. Poultry Item 21(9): 6-7. July 1919. 47.8 P8625  
This is a summary of the results of feeding experiments conducted during 1916 at the Coastal Branch Experimental Plant (North Carolina Experiment Station).
1136. Kennard, D. C., Holder, R. C., and White, P. S. The utilization of soy bean and corn proteins as affected by suitable mineral supplements. Amer. Jour. Physiol. 59(1): 298-309. Feb. 1, 1922.  
447.8 An3  
Bibliography, p. 309.  
"The purpose of the present investigation is to ascertain the value of soy bean meal as a constituent of poultry rations with a view to the practical application of the findings to the needs of the poultry fattening industry. The study deals with the following questions: Is soy bean meal deficient in mineral matter to such an extent as to affect its feeding value; if so, what is the most efficient way of overcoming it, and what effect does it have on the assimilation of protein and the storage of fat."
1137. Kennard, D. C. Vegetable proteins in poultry. Flour & Feed 36(6): 18-19. November 1935. 298.8 F66  
In this article are traced the various tests made in the use of vegetable proteins for poultry feeding. The writer indicates that of the sources of vegetable protein possible in poultry feeding, "none seem to equal soybean oilmeal." He mentions its use in replacing meat scraps or fish meal, and gives the following reasons for its limited use: "(1) the price of soybean oilmeal on

a protein basis has generally been equal to or greater than that of meat scraps or tankage; (2) soybean oilmeal was not generally readily available until very recently."

1138. Philips, Allen G. Feeding soy bean oil meal to laying pullets. A preliminary report, issued by Purdue university shows that the vegetable protein in soy bean oil meal can be utilized to excellent advantage by laying fowls if proper mineral salts are added. Reliable Poultry Jour. 30(4): 435. June 1923. 47 R272P

Results of three experiments starting October 5, 1920, and incomplete at the time of this report.

1139. Philips, Allen G., Carr, R. H., and Kennard, D. C. Meat scraps versus soybean proteins as a supplement to corn for growing chicks. U. S. Dept. Agr. Jour. Agr. Research 18(7): 391-398. Washington, D. C., Jan. 2, 1920. 1 Ag84J

"The object of this experiment was to determine the value of corn protein in the growth of chicks when the proteins were fortified with sufficient ash and with fat-soluble vitamins, as compared with their value when supplemented by varying amounts of proteins derived from meat scraps or soybean meal or from these proteins in combination."

1140. Philips, Allen G., and Hauge, Sigfred M. Soy bean oil meal in rations for laying pullets. Ind. Agr. Expt. Sta. Bull. 293, 20pp. Lafayette, 1925.

Bibliography, p. 20.

"Cereal grains as the sole constituents of the ration for laying pullets are unsatisfactory. This is true because of deficiencies in protein and mineral. The addition of protein in concentrates from animal sources, such as tankage, meat scraps, etc., greatly enhance the value of rations because they possess proteins of high biological value and are also rich in minerals. However, the increasing demand for such supplements will soon exceed the supply. It is therefore desirable to have highly efficient protein supplements from other sources. It has been found that soybeans or their by-product, soybean oil meal, will give practically the same results as these animal proteins when the ration is properly supplemented with minerals."

1141. Prentice, J. H., and Baskett, R. G. The role of separated milk, soya bean meal and minerals in the nutrition of the chick. Northern Ireland. Min. Agr. Jour. 3: 12-28. Belfast, 1931. 10 N81J

1142. Sloan, H. J. Soybeans for poultry. Grain & Feed Jours. Consolidated 75(10): 429. Nov. 27, 1935. 298.8 G762

The value of the oil meal as a protein supplement, the need for supplying the mineral deficiency, the advantage of oil meal over the beans, the use of soybean hay for poultry, and suggested poultry rations for use with soybean oil meal, are considered.



1143. Suzuki, Kozo. Digestion experiment of soy bean cake and kaoliang with poultry. Agr. Chem. Soc. Japan Bull. 7(9-12): 82-84. September-December 1931. 385 Ag8B  
The writer describes digestion trials with 2-year old White Leghorn cocks at the Imperial Zootechnical Experiment Station, Chiba. Digestion coefficients with both soybean cake and kaoliang are given.
1144. Suzuki, Kozo, and Hatano, Tadashi. [Nutritive value of soy-bean cake for hens, II.] Agr. Chem. Soc. Japan. Jour. 6(10, whole no. 73): 900-909. October 1930. 385 Ag8  
"Soy-bean oil cake was given as protein source of the feed. Twelve parts of bone powder, 4 parts of  $\text{CaCO}_3$  and 4 parts of  $\text{NaCl}$  for 100 parts of the cake were supplied. The nutritive value was similar to that of fish meal. It gives results on egg production and wt. of egg similar to those of other animal feeds. III. Ibid 910-6. - The chicks hatched from the eggs as above mentioned were also fed with soy-bean oil cake. No abnormal signs were noted." - Chem. Abs. 25(12): 3036. June 20, 1931.
1145. Suzuki, Kozo, and Hatano, Tadashi. Soya bean cake as protein supplement of poultry feed. World's Poultry Cong.Proc.(1930)4: 288-291. London, 1931. Libr. Cong. SF481.W7 1930  
Discussion follows reading of the paper, pp. 290-291.  
"The fact that it [soybean cake] possesses as much feeding value as fish meal protein, when used as protein supplement in poultry feed in conjunction with proper quantities of calcium, sodium and chlorine, has been ascertained by various experiments, as follows..."  
Also published (without discussion) under title "Soy Bean Cake as a Protein Supplement of Poultry Feed" in U. S. Egg and Poultry Mag. 36(12): 34-35. December 1930. 286.85 Ag3
1146. Tomhave, A. E., and Mumford, C. W. Effect of ground soybeans on the cold storage quality of eggs. Poultry Sci. 12(1): 37-41. January 1933. 47.8 Am33P  
References, p. 41.  
Summary of results of an experiment carried out with Single Comb White Leghorns at the Delaware Agricultural Experiment Station.
1147. Tomhave, A. E., and Mumford, C. W. Ground soybeans as a protein supplement for growing chicks. Del. Agr. Expt. Sta. Bull. 183, 24pp. Newark, 1933.  
"The soybean, a concentrate containing on the average 36 per cent protein is extensively grown in Delaware, and provides a relatively cheap source of protein to the poultrymen of the State provided it is suitable for poultry feeding. It was to determine the value of ground soybeans as a protein concentrate in chick rations that the following experiments were conducted."

1148. Tomhave, A. E., and Mumford, C. W. Ground soybeans as a supplement for laying birds. Del. Agr. Expt. Sta. Bull. 197, 37pp. Newark, 1936.

References, p. 37.

Gives the results of six experiments in feeding.

1149. Wilgus, H. S., Jr., Norris, L. C., and Heuser, G. F. Effect of heat on nutritive value of soy-bean meal. Indus. and Engin. Chem. 28(5): 586-588. May 1936. 381 J825

"Literature cited", p. 588.

"Soy-bean oil meals which are satisfactory as sources of high-quality protein for feeding poultry may be produced by the expeller, hydraulic, and solvent processes, by the application of a sufficient amount of heat. The optimum temperature found in this study for the expeller method was 140° to 150° C. for two minutes in the expeller, and for the hydraulic method was 105° C. for 90 minutes in the cooker. A solvent process meal produced at 82° C. for 15 minutes (the usual commercial procedure) was excellent in protein efficiency.

"The vitamin G content of the soy beans studied was low and was not affected to any measurable extent by the manufacturing processes. The color and flavor of the meals were not infallible criteria of their nutritive value, but a raw, beany flavor was indicative of an insufficient application of heat and a resulting inferior protein efficiency." - Abstract, p. 587.

#### Sheep and Lambs

1150. Evvard, John M., Culbertson, C. C., Hammond, W. E., and Henness, K. K. Soybean hay for fattening lambs. Iowa Agr. Expt. Sta. Bull. 234, pp. 153-183. Ames, 1926.

"This publication is to be considered as a progress report, the intention being to do further work on this subject as soon as facilities are available."

"With the collaboration of Q. W. Wallace."

This study is in two parts: the first giving an historical summary of the previous work done in soybean hay feeding, and the second giving an account of the authors' experiments in feeding soybean hay to fattening lambs. The objects of the experiment "were to find out the relative values of red clover hay, whole soybean hay and ground soybean hay for fattening lambs; to study the effect of feeding the concentrate allowance mixed with ground soybean hay; and to note the effect of the various rations on feed consumption, gains, water consumption, feed requirement, market finish, market value, shrinkage in shipping and character of carcasses."



1151. Evvard, John M. Soybean hay for the breeding ewes. Amer. Soc. Anim. Prod. Proc. (1923): 88-93. 1924. 389.9 Am3R  
"With the collaboration of Russell Dunn and C. C. Culbertson."  
"In order to determine just how good this feed is for ewes, and how it compares with alfalfa hay, we carried out the following experiment."
1152. Hamilton, T. S., Mitchell, H. H., and Kammlade, W. G. The digestibility and metabolizable energy of soybean products for sheep. Ill. Agr. Expt. Sta. Bull. 303, pp. 237-295. Urbana, 1928.  
"The investigations reported herein were undertaken...in order to determine the digestibility and metabolizable energy of soybean hay, soybean straw, whole soybeans, and soybean oil meal. In order to obviate what was thought to be one of the greatest faults with most previous investigations along these lines, that is, the use of too few experimental animals, it was decided to determine the digestibility and metabolizable energy for each feed on each of 12 sheep, a number three times as large as has heretofore been used in any single digestion experiment with soybean products."
1153. Hammond, W. E., Evvard, John M., and Culbertson, C. C. Soybean and alfalfa hays for wintering pregnant ewes. Iowa Agr. Expt. Sta. Bull. 282, pp. 241-256. Ames, 1931.  
This report gives the results of experiments in feeding four lots of the ewes on soybean and alfalfa hays and on certain combinations of these two hays.
1154. Humphrey, George C., and Kleinheinz, Frank. The value of soy beans in grain rations for lambs. Wis. Agr. Expt. Sta. Rept. (1904) 21: 51-55; (1905) 22: 65-68. Madison, [1904-1905.]  
These are reports of two trials which "show that soy beans are an economical supplement to corn for grains with sheep both in body weight and wool production. The increase in wool produced was 13.8 pounds, which sold for thirty cents per pound, increasing the profits by \$4.14."
1155. Kammlade, W. G., and Mackey, A. K. The soybean crop for fattening western lambs. Ill. Agr. Expt. Sta. Bull. 260, pp. 197-211. Urbana, 1925.  
"The two experiments reported in this bulletin were undertaken to determine the usefulness of soybean hay, soybean straw, whole soybeans, ground soybeans, and soybean oil meal when fed with shelled corn, for fattening western lambs."
1156. Kammlade, W. G. Soybeans for fattening lambs. Breeder's Gaz. 83(25, whole no. 2167): 848. June 21, 1923. 49 B74  
"Shelled corn and soybean straw or hullings, supplemented with whole soybeans, ground soybeans, soybean oilmeal or linseed oilmeal, were used in fattening four lots of western lambs at the Illinois Experiment Station..."

1157. Liebscher, W., and Liebscher, K. [Nutritive value of soybean silage.] Landeskult. Wien 1: 214-217. 1934.  
Not examined.  
"Feeding trials with sheep are recorded..." - Chem. Abs. 31(20): 7554. Oct. 20, 1937.
1158. Lindsey, J. B. Digestion experiments with sheep. Mass. Hatch Agr. Expt. Sta. Ann. Rept. (1903) 16: 63-79. Boston, 1904. (Public Doc. 33)  
A table giving data for the sheep fed on soybean meal is shown, p. 72; and the results discussed for the soybean meal feeding test, p. 78.
1159. Miller, John I., Morrison, F. B., and Maynard, L. A. Relative efficiency for growing lambs of the protein in rations supplemented by soybean-oil meal, linseed meal, or corn-gluten meal. U. S. Dept. Agr. Jour. Agr. Research 54(6): 437-448. Washington, D. C., March 15, 1937. 1 Ag84J  
"...This paper is part of a thesis presented by John I. Miller to the Graduate School of Cornell University in partial fulfillment of the requirements for the degree of doctor of philosophy." - Note.  
"The results obtained in these two series of experiments with growing lambs indicate that soybean-oil meal, linseed meal, and corn-gluten meal have the same efficiency as supplements to a low-protein basal ration of corn and timothy hay or a ration of corn and corn stover insofar as the protein utilization of the total ration is concerned."
1160. Richards, W. B., and Kleinheinz, Frank. The value of soy beans as a part of a grain ration for lambs. Wis. Agr. Expt. Sta. Rept. (1904) 21: 51-55. Madison, Democrat print. co., State printer, 1904.  
"The object of this experiment was to compare the feeding value of soy beans with oats fed as an adjunct to corn."
1161. Ruffner, R. H. Soy bean hay versus alfalfa hay for winter maintenance of sheep. N. C. Agr. Expt. Sta. Ann. Rept. (1927) 50: 48-50. Raleigh [1928].  
Feeding experiments.
1162. Turk, Kenneth L., Morrison, F. B., and Maynard, L. A. The nutritive value of the proteins of corn-gluten meal, linseed meal, and soybean-oil meal. U. S. Dept. Agr. Jour. Agr. Research 51(5): 401-412. Washington, D. C., Sept. 1, 1935. 1 Ag84J  
Literature cited, pp. 411-412.  
"These data show the superiority of soybean-oil meal over those furnished by linseed meal and corn-gluten meal. Furthermore, they indicate that it is possible to measure differences in quality of protein using sheep and the nitrogen-balance type of experimentation."



Food Uses

1163. Adolph, William Henry, and Wu, G. M. Additional notes on soy-bean products. Natl. Med. Jour. China 6: 231-233. 1920.  
Not examined.
1164. Adolph, William Henry, and Wang, Ying-Lai. The digestibility of the protein of soybean milk. Chinese Jour. Physiol. 8(2): 171-178. May 15, 1934. 447.8 C44  
Literature, p. 178.  
"Ten-day digestion experiments with albino rats were used to determine the apparent digestibility. The protein of soybean milk and the protein of cow milk were found to have a digestibility of 84.9 percent and 86.6 percent respectively."
1165. Adolph, William Henry. A 4000-year food experiment. Sci. Amer. 143(6): 425-428. December 1930. 470 Sci25  
In this article the food needs of the Orient are compared with those of America, and the important place of soybeans in the economy of China is brought out. Reference is made to the meaning China's food habits may have for this country.
1166. Adolph, William Henry, and Kao, Hsueh-chung. Hemoglobin-building properties of soy bean products. Chinese Jour. Physiol. 6(3): 257-263. Aug. 15, 1932. 447.8 C44  
"(From the Department of Chemistry, Yenching University, Peiping.)"  
Literature, p. 262.  
"Curative experiments on rats rendered anemic on an exclusive diet of cow's milk demonstrate that soy bean meal, soy bean cheese, and soy bean milk are effective in the regeneration of hemoglobin. Analyses of these food materials indicate that they contain appreciable amounts of iron and copper." - Summary, p. 262.
1167. Adolph, William Henry. How China uses the soy bean as food. Jour. Home Econ. 14(2): 63-69. February 1922. 321.8 J82  
The paper "is a summary of some studies which have been made in the Shantung Christian University laboratory on soy bean products", and has for its purpose the calling of attention to the numerous forms in which oriental people have long used the bean. It is suggested that many of these dishes are well worth adoption in the United States.
1168. Adolph, William Henry, and Kiang, P. C. Nutritive value of soy-bean products. Natl. Med. Jour. China 6: 40-49. 1920.  
Not examined.

1169. Adolph, William Henry, and Chen, Shen-Chao. The utilization of calcium in soy bean diets. Jour. Nutrition 5(4): 379-385. July 1932.  
389.8 J82

References, p. 385.

"The experiments here reported were planned for the purpose of determining the extent to which an adult can utilize the calcium of soy bean curd."

1170. Adriano, F. T., Oliveros, S. B., Santos, D. S., and Villanueva, E. R. The physical characteristics and chemical composition of various brands of toyo (soy sauce) sold in the Philippines. Philippine Jour. Agr. 5(3): 171-186. 1934. 25 P543

References, p. 186.

Gives methods of manufacture of soy sauce, and an analysis of twenty-one samples.

1171. Allen, Paul W. Industrial fermentations. 424pp. New York, The Chemical catalog co., inc., 1926. 390 A15

"References" at end of most chapters.

Ch. 14. Soy-Bean Sauce Manufacture, pp. 123-127. The chapter is chiefly a series of quotations from M. Church of the United States Department of Agriculture, on the preparation of soy sauce and the possibilities for the industry in the United States. Other authorities are cited on the industrial applications of the fungus used in soy sauce.

1172. Andrović, Edwino. Studi teorici e pratici sull'olio di semi di cotone e di semi di soya. Pt. 1. 52pp. Zara, Stab. Tip. di Spiridione Artale, 1923. 307 An22

"R. Università degli studi - Roma."

Olio di Semi di Soya, pp. 42-52. The writer, in this section, brings out his work in producing an edible oil or fat from the soybean for the Gudahy Packing Co. of Omaha. He describes the chemical qualities of the oil, the processes used in refining it, and the use for the refined product in cooking and in the canning industry.

1173. Annen, H. Die sojabohne. Das mühlenlaboratorium v. 3, no. 9, columns 159-167. Sept. 7, 1933. (Suppl. to 298.8 M89. Filed in Dr. Fellows' office, BAE)

A discussion of the value of the soybean as a food and its use in baking.

1174. Bailey, L. H., Capen, R. G., and LeClerc, J. A. The composition and characteristics of soybeans, soybean fleur, and soybean bread. Cereal Chem. 12(5): 441-472. September 1935. 59.8 C33

"Food Research Division Contribution No. 242."

"Literature cited", pp. 470-472.

This study takes up the following topics: acreage, production, and price of soybeans in the United States; uses for soybeans; the



chemical composition of the beans; processes for removing the bitter taste of the beans; extraction of soybean oil; chemical composition of the soybean flour; the food value of the flour and its use in baking.

1175. Balland. Le soja dans l'alimentation française. Paris. Académie des sciences Comptes Rendus 164, 1<sup>er</sup> sem.(7):300-302. Feb.12, 1917. 505 P21

"Descriptions and analyses are given of some soy-bean products used in France. Among those used in the army are canned raw soy beans, canned soy-bean soup, whole beans, soy-bean flour, and war bread and biscuit made with soy-bean and wheat flours." - Expt. Sta. Rec. 37(2): 164-165. August, 1917.

1176. Bardet. Sur un pain sans matières amylacées à base de soja hispida. Bulletin Général de Thérapeutique Médicale, Chirurgicale, Obstétricale et Pharmaceutique 149(5): 181-184. 1905. Army Medical Library.

Paper presented at the session of January 25, 1905, of the Société de Thérapeutique.

Discussion, pp. 183-184.

A description and analysis of bread made with soybean flour, and an indication of its value for diabetics.

1177. Becker, Christian. Soja bei eitrigen harninfektionen, ekzem und diabetes. Archiv für Verdauungs-Krankheiten, Stoffwechselfathologie und Diätetik 56(5-6): 260-278. November 1934. Army Medical Library  
"Literatur", p. 278.

The use of a soybean diet in treating purulent urinary infections, eczema and diabetes.

1178. Berczeller, Lázló. Arbeiten über das Berczeller'sche sojanehl. hefts I-III, processed. Wien, 1928-1930. 389 B453

Three volumes bound in one; paged variously.

This is a compilation of articles reprinted from various sources on the soybean flour invented by Berczeller.

Partial contents: Heft I, 1928. Die Bedeutung der Soja für die Volksernährung, by L. Berczeller, 6pp. (The importance of the soybean in human nutrition. Reprinted from Therapie, 1927.); La Farine de Soja, by Jean Freud, 4pp. (Soy flour. An extract from La Presse Médicale, no. 6, Jan. 19, 1927.); Das Sojanehl als Nahrungsmittel, by H. Wastl, 7pp. (Soy flour as food. Appeared in "der Wiener Medizinischen Wochenschrift", no. 41, 1926.); The Use of the Soy Bean in Human Nutrition, by T. R. Parsons, 4pp. (Reprinted from The Lancet, p. 267. Jan. 29, 1927.); The Advantages of Growing Soya Bean in Ireland, by D. T. Barry and J. Freud. (Taken from the Farmers' Gazette, p. 297, March 5, 1927. Includes discussion of soybean flour.); Das haltbare Sojanehl, by H. Wastl, 3pp. (The stable soy flour. Taken from Die Mühle, no. 34, 1927.); Berczeller's Soya Flour. An Economic Aspect of the Alimentary

Problem, by John Freud, 3pp.; Das Sojamehl in der Diät der Zuckerkranken, by Josef Szanto, 3pp. (Soy flour in the diet of diabetics. Translation from the Hungarian. Reprinted from *Therapia*, January 1928.); Die Aufgaben der Sozialpolitik bei der Einführung des Sojamehles, by P. Frankfurter, 9pp. (The introduction of soy flour in relation to social policy. Includes a comparison of the food value of soy flour with other products.); Zum Problem der Uebervölkerung, by Fritz Löw, 2pp. (Soy flour in its relation to the problem of over-population.); Die Bedeutung des Berczeller'schen Sojamehles für die Nahrungsmittelindustrie, by Wilhelm Gerö, 3pp. (The uses to which soy flour may be put in the food industry.); Die Verwendung des Berczeller'schen Sojamehles für die Brotbereitung, by P. Frankfurter, 5pp. (The use of soy flour in bread making.); Das Berczeller'sche Sojamehl vom bäckereitechnischen Standpunkt, by Viktor F. A. Richter. I. Brot, 5pp. II. Teil: Milchbrot, Gebäck, Zuckerbäckereien und Backhilfsmittel, 4pp. (Part I and II of an article on Berczeller's soy flour from the technical point of view in baking. The first part discusses its use in bread making, and the second takes up its use in milk bread, pastry, confectionery, and self-raising flour.).

1178a. Heft II. 1929. Integriamo la "Battaglia del Grano", by Enzo Giasotto, 3pp. (An extract from *Echi e Commenti*, no. 31. Nov. 5, 1926. Discusses the food value of soy flour and its importance to Italy.); Zur Einführung des Berczeller'schen Sojamehles in Italien, by A. Kramer, 8pp. (Includes a general section on the importance of the soybean and soy flour.); Ueber die Verwendung des Berczeller'schen Sojamehle in Kriege, by L. Dionfeld, 5pp. (On the use of soy flour in war time.); Haltbares Sojamehl, by Ernst Kupelwieser, 3pp. (The food value and relative cheapness of soy flour are discussed.); White Bread versus Brown Bread or the Bread of To-Morrow, by Victor F. A. Richter, 6pp. (Reprinted from *Year Book of the Scottish Association of Master Bakers* 1929, p. 115. Mentions the increased food value of bread when soy flour is added to it.).

1178b. Heft III. 1930. The Technology of Breadmaking and the Dr. Berczeller's New Soyflour, by Victor F. A. Richter. I. Bread, 4pp. II. Milkbread, rolls, smallgoods, pastries, etc., 7pp. (This is a translation of the article in Heft I: Das Berczeller'sche Sojamehl vom bäckereitechnischen Standpunkt.); Edelsoja. Was jede Hausfrau von diesen neuen Nahrungsmittel wissen sollte, by Hertha Sprung, 3pp. (A discussion of the nutritive value of the new soy flour. Reprint from *Die Oesterreicherin* I. Jahrgang, nr. 8, Oct. 1, 1928.); Flour Production. Soja Beans and a New Process, by Fabian White, 3pp. (Reprinted from *Industrial World*, 1929. The importance and food value of the flour are described.); Soya Products, by Dr. Cronshaw, 1p. (Extract from "The Food Manufacture" January 1929. Briefly mentions the uses for the new soy flour.);



Soya Flour, 2pp. (Reprinted from Food Manufacture, February 1929.); The Dr. Berczeller's soya flour in the Vienna and continental bakery, by Victor F. A. Richter, 7pp. (Recipes.); Soya Bean Flour. Its Value to the British Confectioner, by W. P. Ford, 4pp. (Reprinted from Confectionery Craft, August 1929.); Die Bedeutung des Berczeller'schen Sojamehles für Grossbritannien, by H. Prinz, 7pp. (This is a study of the importance of the soy flour to Great Britain, but contains a section on the characteristics and food value of the flour.)

Einige Gutachten über das Berczeller'sche Sojamehl. (See note under "Expert opinions on the Berczeller soy flour", which is a translation of this.)

1178c.

Bound in with these publications is an additional set of papers on the flour taken from periodicals and newspapers, including: Edelsoja und das Konditorgewerbe, 5pp. (Reprinted from Der Konditor, no. 33, Nov. 20, 1928. Soy flour in the pastry industry.); Die Edelsoja - ein neues Nahrungsmittel, 11pp. (Reprinted from the Linzer Tagblatt, Nov. 11, 1928. Soy flour as a food.); Die Edelsoja. Ein neues Nahrungsmittel, 2pp. (Appeared "im Neuen Wiener Tagblatt", Dec. 1, 1928. Abstracts of talks given at a session of the Bund Österreichischer Frauenvereine on the value of soy flour.); Die Edelsoja, pp. 1-3. (Appeared "in der Neuen Freien Presse", Dec. 5, 1928. Outlines the value of soy flour and speeches made at the session of the Bund Österreichischer Frauenvereine.).

Das ernährungsphysiologische Laboratorium in Wien, by L. Berczeller, 111pp., describes the founding of the Laboratory and lists the publications which have appeared as a result of its work.

1179. Berczeller, László. Ueber die biologische wertung der nahrungsmittel. Wiener Klinische Wochenschrift 34(42): 507-511; (43): 524-525; (44): 536-538. Oct. 20-Nov. 3, 1921. Army Medical Library

Includes, p. 525, a summary of results of experiments to ascertain the biological value of soybean flour as food.

1180. Berczeller, László. Die untersuchung des sojamehles. Biochemische Zeitschrift 129(3-4): 313-319. May 3, 1922. 384 B522  
Soybean meal as used in nutrition studies with rats.

1181. Bloch, A. Quelques mots sur la fabrication et la composition du Teou-fou (fromage de haricots chinois fourni par le soja hispida). Bulletin des Sciences Pharmacologiques tome 13, 8<sup>e</sup> année, no. 3, pp. 138-143. March 1906. Army Medical Library.  
Description of the manufacture and composition of tofu, or Chinese soybean cheese.

1182. Bogatskii, V. D., Storozhuk, M. K., and Muromtsev, V. A. Technologie der herstellung und methoden der desodorierung der sojamilch. Moscow. Zentrales Biochemisches Forschungs-Institut der Nahrungs- und Genussmittelindustrie, Schriften 2(9): 410-430. 1933.  
389.9 M85  
Article in Russian with alternate titles and summary in German. Commercial preparation and methods of deodorization of soy milk. "Detailed directions are given for prepg. and grinding soy beans, emulsifying, boiling and deodorizing by blowing with hot air..." - Abstract by Julian F. Smith in Chem. Abs. 27(21): 5438. Nov. 10, 1933. 381 Am33C
1183. Bowers, W. G. Some studies on the nutritive value of the soy bean in the human diet. N. Dak. Agr. Expt. Sta. Food Dept. Spec. Bull. 5(13): 278-328. August 1919.  
"A thesis presented for the degree of Doctor of Philosophy to the Faculty of the Ohio State University."  
Bibliography, pp. 325-327.  
Extent of production, pp. 278-280; Human food preparation made from the soy bean, pp. 280-281; Character of the carbohydrates of the soy bean and its bearing on nutrition, pp. 282-283; Character of the fats of the soy bean and its bearing on nutrition, p. 283; Character of the protein and its bearing on nutrition, pp. 283-284; Vitamines of the soy bean, pp. 284-285; Minerals of the soy bean, pp. 285-286; The soy bean compared to some other legumes used as human food as to fuel value and organic nutrients, p. 286; Digestibility of soy bean products, pp. 286-287; Experimental part, pp. 287-319. ("In our experimental work we propose to inquire into the digestibility of soy cake meal. We shall then determine the digestibility of the different carbohydrates as found in a representative variety of the soy bean. After passing some of the beans thru a milling process we shall study the composition and digestibility of the meal and bran and determine their relative amounts of calcium and phosphorus, and locate any possible poisons or objectionable substances that may be present in either of these. This will make it possible, then, to determine whether or not it would be profitable to carry on the milling process and eliminate certain products, or whether by the use of certain extractives we can get rid of the objectionable constituents."); Discussion of results, pp. 319-323; Summary, pp. 323-324.
1184. [Buchanan, A. E., Jr.] Soybean flour. Sci. Amer. 149(1): 28-29. July 1933. 470 Sci25  
This is a very brief account of the soybean flour "Nusoy" and its uses.
1185. Bugby, William. Soy beahs as human food. Veg. Messenger and Health Rev. (ser. 8, 63d year) 8(3): 83-84. March 1911. Libr. Cong. TX392.A4  
"The true economy...is to use the Soy bean itself direct, as a perfect and superior substitute for flesh meat."



1186. Campbell, Mabel. The soy bean - a little known legume. R. I. State Bd. Health Bull. 3(3): 46-49. July 1917. 449.9 R34B  
The food value of the bean is described and recipes are given.
1187. Cappelli, Giuseppe. Sul panè con soia e di soia. Lo Sperimentale 81(4): 546-557. Oct. 14, 1927. Army Medical Library.  
A study of results obtained in breadmaking tests in which various proportions of wheat and soy flour were used.
1188. Carles, P. Le lait végétal. Répertoire de Pharmacie, 63<sup>e</sup> année, 3<sup>e</sup> série, tome 19, no. 11, pp. 487-488. Nov. 10, 1907. Libr. Cong. RSL.R4  
Characteristics and value of vegetable milk made from soybeans.
1189. Carnean, Mrs. Thora M. And now - soybean flour. Farmers' Elevator Guide 28(3): 31. March 1933. 280.28 Am3  
Food value of the flour, method of using it, and recipes are included.
1190. Castagnol, E. M. Etude sur la fabrication du lait de soja. Bulletin Economique de l'Indochine 37: 982-994. September-October 1934. 22.5 In2  
The writer takes up the method of preparation of soybean milk, the chemical composition of the soybean, the amount of product obtained at various stages of the preparation, ability of soybean milk to ferment, and the problems arising in the home manufacture of the milk, and the production on a large or small scale for sale.
1191. Cates, J. Sidney. Soy beans go domestic. Country Gent. 103(2): 6, 58. February 1933. 6 C833  
The discovery of new green-vegetable varieties for human consumption, and the importance of soybeans as a source of protein are taken up.
1192. Chang, Ke-Chung, and Tso, Ernest. A soluble soybean milk powder and its adaptation to infant feeding. Chinese Jour. Physiol. 5(2): 199-203. May 15, 1931. 447.8 C44  
Literature, p. 202.  
"A spray process on an experimental scale is described for the drying of soybean milk. The powder exhibits similar physical properties as powdered cow's milk. With the addition of certain supplementary foods, test feeding on one infant for a period of 84 days was completely successful." - Summary, p. 202.
1193. Chen, Chac-Yu. A comparison of the nutritive value of beef, egg white and dried soybean curd with reference to Vitamin B. Natl. Univ. Peiping Col. Agr. Nutrition Bull. 4: 1-11. 1937.  
Not examined.

1194. Ch'en, Shen-Chao, and Adolph, William H. Bone building potency of soy bean diets. Chinese Jour. Physiol. 6(1): 59-62. Feb. 15, 1932. 447.8 C44  
"Read before the Fifth Annual Meeting of the Chinese Physiological Society...at Peiping, February 16-18, 1931."  
"In connection with our interest in the use of soy bean milk in nutrition, experiments were projected for the purpose of evaluating the bone building properties of soy bean products and comparing them with cows' milk."
1195. Chevalier, J. Pains de soja et de gluten pour diabétiques. Bulletin Général de Thérapeutique Médicale, Chirurgicale, Obstétricale et Pharmaceutique 157(22): 845-846. 1909. Army Medical Library  
Paper presented before the session of the Société de Thérapeutique, May 26, 1909.  
Describes the value of soy bread and gluten bread for diabetics.
1196. Chiu, Yan-Tsz. Analyses of Chinese foods. II. Determination of pentosans in soybeans and soybean milk. Lingnan Sci. Jour. 11(1): 1-3. January 1932. 22.5 C16  
Selected references, p. 3.  
"It is found that the amount of pentosans present in the milk varies with the filter used in making the milk and also the size of the bean particles ground in the mill..."
1197. Chiu, Yan-Tsz. Suggested improvements in the manufacture of soy bean milk. Lingnan Sci. Jour. 8: 573-576. December 1929. 22.5 C15  
Bibliography, pp. 575-576.  
Changes in methods of manufacture in order to remove the unpleasant taste and odor of the milk, and the addition of other nutritious ingredients and flavor are discussed.
1198. Church, Margaret B. Soy and related fermentations. U. S. Dept. Agr. Dept. Bull. 1152, 27pp. Washington, D. C., 1923. 1 Ag84B  
Bibliography, pp. 25-26.  
An account chiefly of the making of soy sauce in Oriental countries, and the possible manufacture and use of the product in the United States.
1199. College of agriculture and mechanic arts of University of Porto Rico, Mayaguez. Cooking qualities of soybeans. Puerto Rico Agr. Expt. Sta. Rept. 1936: 84. San Juan, P. R., 1937.  
Under "Cooking tests" the following statement is made: "Dry seed of the edible varieties tested was sent to the office of the Home Demonstration Work of the Agriculture Extension Service of the University of Puerto Rico to study their culinary qualities."



1200. Collin, Eug. La graine, la poudre et le tourteau de soja. Annales des Falsifications 3(15): 19-24. January 1910. 389.8 An72  
This is a chemical study of the soybean. Reference is made to food products made from it, and its history in France.
1201. Concepcion, Isabelo. The greater significance of soy bean in the Filipino dietary. Philippine Islands Med. Assoc. Jour. 12(3): 97-106. March 1932. Army Medical Library.  
"Read in the Symposium on Nutrition...Manila Medical Society on January 25, 1932."  
"With a well-laid-out campaign to promote the intelligent use of soy beans, it is probable that inside of ten years the food and population problem will be well out of the way for centuries to come."
1202. Costa, Domenico. Sulla panificazione con le farine di estrazione di soia. Annali di Chimica Applicata 17(11): 524-530. November 1917. 385 An7  
The efforts made at various times to use the soy for national feeding in Italy, are outlined. It is pointed out that Government reduction of grain imports has stimulated studies for the use of soy flour in bread making. A chemical analysis of soy flour, and the types of bread produced in various tests are given.
1203. Coville, Frederick V. Soybean cheese. Science (n.s.) 70(1812): 282-283. Sept. 20, 1929. 470 Sci2  
Description of soybean cheese and its making.
1204. Dacy, George H. Cheap foods from soy beans. Country Gent. 82(19): 863. May 12, 1917. 6 C833  
"A soy-bean substitute is available for nearly every ordinary dish on the average menu."
1205. Daniels, Amy L., and Nichols, Nell B. The nutritive value of the soy bean. Jour. Biol. Chem. 32(1): 91-102. October 1917. 381 J824  
The writers give the results of feeding experiments on rats.
1206. Demolon, A. Lait végétal? Journal d'Agriculture Pratique (n.s.) 21(5): 140-141. Feb. 2, 1911. 14 J82  
This is a response to an article in the Journal by Mr. Li-Yu-Ying. The author takes up the question of whether this product of the soy can properly be called "milk." He discusses the differences in composition between natural milk and soy (vegetable) milk. The article is written from the viewpoint of the use of the milk for France.
1207. Dietz, R. Die bedeutung des sojamehls als backhilfsmittel bei weizenmehlen. Das mühlenlaboratorium, v. 3, no. 12, columns 209-214. Dec. 7, 1933. (Suppl. to 298.8 M89. Filed in Dr. Fellows' office, BAE)

Gives the results of baking tests to discover the value of soybean flour as a supplement to wheat flour.

1208. Dittes, Frances L. The soy bean as human food. Tenn. Acad. Sci. Jour. 8(3): 323-328. July 1933. 500 T25A

"Read before the Tennessee Academy of Science at the Nashville meeting, November 27, 1931."

Bibliography, p. 328.

Food products from soybeans and their value as food. The writer concludes:

"Thus, there are significant reasons for expecting that the soy bean will become one of our most stable and prominent sources of fat and protein. There are reasons to expect also that the United States will become the leader in introducing the soy bean in the daily diet of the white race."

1209. Dox, Arthur W. Experiments with soy bean meal as a substitute in the army ration. Iowa Acad. Sci. Proc. (1918) 25: 517-519. Des Moines, 1918. 500 Ie93

Favorable tests in the use of soy meal and soybean flour in bread in army camps.

1210. Ducceschi, V. La farina di soja nella alimentazione umana. Archivio di Fisiologia 25(3): 428-468. July-September 1927. Army Medical Library.

Bibliografia, pp. 466-467.

An account of research conducted to determine the nutritive value of soybean flour when mixed with wheat flour in bread making, and in other preparations.

Abstract by Grimme in Chemisches Zentralblatt 99(band 2) (1): 115. July 4, 1928, under title "Sojamehl in der menschlichen Ernährung."

A shorter account of these experiments is to be found in the author's articles of the same title in Società Italiana di Biologia Sperimentale Bollettino 2(3): 279-282; (5): 478-479. June 12, Sept. 6, 1927. 442.8 Sol2

1211. Ducceschi, V. Osservazioni relative alla nota del Dott. Romolo Venturi sulla utilizzazione della soja per l'alimentazione umana. Biochimica e Terapia Sperimentale 14(12): 400-402. Dec. 31, 1927. 385 B52

These are remarks on the note of Venturi on the utilization of the soybean as human food.

1212. Durkee, M. M. Soybean oil in the food industry. Indus. and Engin. Chem. 28(8): 898-903. August 1936. 381 J825

"Symposium on the Chemistry and Technology of Soybeans, Presented before the Division of Agricultural and Food Chemistry at the 91st Meeting of the American Chemical Society, Kansas City, Mo., April 13 to 17, 1936."



"Literature cited", p. 903.

Methods of extracting the oil, its composition, steps taken in refining the oil, trade channels for the oil, special types of oil used in certain foods such as salad oil, margarines and vegetable shortenings are discussed. The problem of reversion of the oil after refining is brought out and the need for research is emphasized.

Abstract in "The Utilization of Soya Beans". Chem. Age [London] 34 (880): 417-418. May 9, 1936. 382 C427

1213. Edible soya flour. Food Manfr. 6(11): 334-335. November 1931. 389.8 F736

This is a very brief account of the soy flour (Soyelk) and the trade outlets and uses for it.

1214. Elsdon, G. D. The chemistry and examination of edible oils and fats, their substitutes and adulterants. 521pp. London, Ernest Benn, Ltd., 1926. 307 E17

Ch. XI, Soya-Bean Oil, pp. 188-195. Quotations are made from various writers on the uses of the plant (Toch), the commercial uses and methods for obtaining oil and protein (Satow), chemical composition of the oil, composition of hydrogenated oil, and the nature of "soy" and "saké" oils and of soybean miso oil. Additional references are grouped at the end of the article. The references in the article are from the Journal of the Society of Chemical Industry.

1215. Evvard, John M. Soybeans for flour. Grain & Feed Jours. Consolidated 74(2): 57. Jan. 23, 1935. 298.8 G762

The numerous uses for the flour and its value in nutrition are pointed out.

1216. Expert opinions on the Berczeller soy flour. various paging, processed. Wien, Fritz Löw [1928?] 389 Ex (Pam. Coll.)

Contains letters in translation from Dr. Schwicker Alfred, Dr. Stefan Weiser and Roszony, on soybean flour; an article by A. Durig, "The Soy as a Foodstuff", 3pp., 1926 (Emphasizing its importance if it can be supplied in an appetizing way); and analyses of the flour by Dr. Helene Wastl, and Dr. Ernst Kupelwieser. "The Publications on Berczeller Soy Flour" are given at the end.

This same pamphlet in German is bound in Berczeller, Lázló. Arbeiten über das Berczeller'sche Sojamehl. 389 B452

1217. Ferrée, C. J. The properties of processed soya. Food 5(59): 442-443. August 1936. 389.8 F738

A defense of soy flour in bread making, in reply to the article by Dr. Drake Law in the April issue of Food.

1218. Ferrée, C. J. The soya bean and the new soya flour; revised translation from the Dutch by C. J. Ferrée and J. T. Tussaud. 79pp. London, William Heinemann (medical books) ltd., 1929. 60.3 F41 Bibliography, pp. 78-79.

"In the following pages the writer has endeavoured to give an account of the numerous uses to which the soya bean has so far been put, and to visualise its future service to humanity through the means of a totally new and practical process by which this legume...may in future be used as an important article of food for general consumption throughout every quarter of the globe.

"In compiling the details relative to the soya bean flour, with which this brief summary principally deals, he trusts that he has succeeded in giving sufficient data to enable the reader to fully realise its value as a staple food from the economic point of view, as well as from the more domestic standpoint, so that the important fact may be fully realised that a new foodstuff of a very valuable nature...has now been brought within the reach of all nations to serve them in a most practical manner as an economic article of food." - Preface.

The book includes statistical material on the imports and exports of soybeans, soybean oil and cake in various countries.

1219. Fiehe, J. Über sojabohnen und sojabohnenbrot. Zeitschrift für Untersuchungen der Nahrungs- und Genussmittel 49(1-2): 45-51. January-February 1925. 384 Z39

A discussion of the food value of the soybean and of the composition and value of soybean bread.

1220. Field, Ada M., Alexander, Beulah H., and Sylvanus, Ethel B. Soy-bean paste as an emulsifying agent. Science (n.s.) 77(1986): 91. Jan. 20, 1933. 470 Sci2

"Soy-bean paste as emulsifying agent in salad dressing has several merits. Among these are: (1) low cost, (2) ease of shipping and storing the beans, (3) heat sterilization of paste immediately before use, (4) the incorporation of rather a large volume of liquid for a given viscosity..."

1221. Frey, Charles N., Schultz, A. S., and Light, R. F. The effect of active soybean on vitamin A. Indus. and Engin. Chem. 28(11): 1254. November 1936. 381 J825

"The effect of the decolorization of carotene by ground soybeans on its vitamin A potency was studied."

1222. Friedenwald, Julius, and Furuh, John. The use of the soy bean as a food in diabetes. Amer. Jour. Med. Sci. 140(6, whole no. 465): 793-803. December 1910. 448.8 Am3

The results of studies by the authors bring out the following conclusions: "(1) The soy bean is a valuable addition to the dietary of the diabetic on account of its palatability, and the numerous ways in which it can be prepared. (2) The soy bean in



some way causes a reduction in the percentage and total quantity of sugar passed in diabetic subjects on the usual dietary restrictions."

1223. Geerligs, H. C. Prinsen. Über die anwendung von enzymwirkungen in der Ostasiatischen hausindustrie. Zeitschrift für Angewandte Chemie, Wirtschaftlicher Teil 50(37): 256-257. May 8, 1917. 384 Z33  
This paper was read before the Niederländische Chemische Vereinigung, General session in the Hague, Dec. 28, 1916.  
The paper is on the domestic application of enzyme actions in Eastern countries, and describes, among other things, the making of fermented soybean food products.
1224. Gibbs, H. D., and Agcaoili, F. Soja-bean curd, an important Oriental food product. Philippine Jour. Sci. 7, Sec. A.(1): 47-51. February 1912. 475 P53  
The authors discuss chemical analyses of soybeans, method of manufacture of the curd around Manila, and adulteration of the product in the locality.
1225. Gill, Augustus H., and Ma, Yu M. The hydrogenation of soybean oil. Oil and Fat Indus. 5(12): 348-351. December 1928. 307.8 J82  
"Experimental investigation of its application to lard-substitute production."
1226. Gironcoli, Ugo de. Contributo clinico alle ricerche sul contenuto di fattore A negli oli vegetali. La Pediatria [Naples] 34(24): 1333-1348. Dec. 15, 1926. Army Medical Library.  
Bibliografia, p. 1348.  
An account of clinical studies made with infants from which conclusions were drawn as to the vitamin A content of soybean and olive oil.
1227. Goldberger, Joseph, Wheeler, G. A., Lillie, R. D., and Rogers, L. M. A study of the blacktongue preventive action of 16 foodstuffs, with special reference to the identity of blacktongue of dogs and pellagra of man. U. S. Treasury Dept. Pub. Health Repts. 43(23): 1385-1454. Washington, D. C., June 8, 1928. 151.65 P96  
References, pp. 1448-1449.  
Soy bean, pp. 1400-1402.
1228. Goldberger, Joseph, and Tanner, W. F. A study of the pellagra-preventive action of dried beans, casein, dried milk, and brewers' yeast, with a consideration of the essential preventive factors involved. U. S. Treasury Dept. Pub. Health Repts. 40(1): 54-80. Washington, D. C., Jan. 9, 1925. 151.65 P96  
References, p. 80.  
Trials with soybeans in a pellagra-preventive diet, pp. 55-59.

1229. Grinne, Clemens. Die sojabohne und ihre verarbeitung zu nahrungs- und gemusmitteln. Konserv-Zeitung 15(1): 1-3; (2): 10-11. Jan. 2-9, 1914. 389.8 K83  
"Data are presented regarding the manufacture, characteristics, composition, and uses of soy bean milk, soy bean cheese (curd), soy bean bread, soy sauce, and other products." - Expt. Sta. Rec. 31: 66. 1914.
1230. Hanauer. Neues von den medizinaldrogen. Schweizerische Wochenschrift für Chemie und Pharmazie 51(31): 453-455. Aug. 2, 1913. 396.8 Sch9  
"The soy bean is recommended as nourishing food, and in cases of diabetes and inflammation of the kidneys." - Chem. Abs. 7: 4044. October-December 1913.
1231. Hansen, Louis A. The soy bean as human food. Life and Health 48(2): 21-23, 27. February 1933. Libr. Cong. RA773.L6  
In this article are given the history of the bean, its value as a food, and its uses as flour, milk and soy sauce. Reference is made to the findings of American scientists.  
Also in Jamaica Agr. Soc. Jour. 37(3): 147-151. March 1933.  
8 J8223
1232. Hardenburg, E. V. The soybean as human food. Market Growers Jour. 43(9): 716. Nov. 1, 1928. 6 M34  
The limited food use of the soybean in this country as compared with the Orient, is ascribed to the competition of the better-known navy bean. The dry and green soybeans are said to be found mainly in the markets of large cities. Various foods made from soybeans are cited, and the composition of navy bean and soybean seed are compared in a table.
1233. Hayward, J. W., Steenbock, H., and Bohstedt, G. The effect of cystine and casein supplements upon the nutritive value of the protein of raw and heated soybeans. Jour. Nutrition 12(3): 275-283. Sept. 10, 1936. 389.8 J82  
Literature cited, pp. 282-283.  
"The primary objective of these experiments was to demonstrate if the beneficial effect of heat was exerted on the protein fraction only or whether the digestibility and ability of other constituents of soy beans were likewise improved."
1234. Hayward, J. W., Steenbock, H., and Bohstedt, G. The effect of heat as used in the extraction of soy bean oil upon the nutritive value of the protein of soy bean oil meal. Jour. Nutrition 11(3): 219-234. March 1936. 389.8 J82  
"This research was made possible by a fellowship supported by Allied Mills, Inc., Chicago, Illinois...Published with the permission of the director of the Wisconsin Agricultural Experiment Station, Madison."  
"Literature cited", pp. 233-234.



"Raw soy beans were found to contain protein of low nutritive value as determined by the grams of growth per gram of protein eaten. Commercial soy bean oil meals such as the expeller meal processed at low temperatures, 105° C. for 2 minutes or the hydraulic meal cooked at 82° C. for 90 minutes contained proteins similar in nutritive value to the raw soy beans. On the other hand, commercial soy bean oil meals which had been prepared at medium and high temperatures such as expeller meals processed at 112 to 130 and 140 to 150° C. for 2 1/2 minutes or hydraulic meals cooked at 105 and 121° C. for 90 minutes contained proteins which had about twice the nutritive value of the raw soy beans or low temperature meals..." - Summary, p. 231.

The experiments were conducted with rats.

1235. Hentze, G. Praktische versuche über einige verwendungsmöglichkeiten von pflanzenlecithin (phosphatide). Zeitschrift für Ernährung 1: 53-61. 1931. 389.8 Z32  
"Com. lecithin obtained by the Bollmann method (C.A. 17,3234) from soy beans consists of 60 lecithin and 40% fat. The plant product has the same chem. and phys. properties as that from eggs and is cheaper. It is possible to use this soy lecithin in place of egg yolk in baking. Five tablespoonfuls of a 20% soln. correspond to 1 egg." - Chem. Abs. 25: 2780. May-August 10, 1931.
1236. Hepburn, Joseph Samuel, Sohn, Keun Sung, and Devlin, Laurence Patrick. Biochemical studies of soybean milk and chicken protein. Jour. Franklin Inst. 217(2): 213-221. February 1934. 470 J82  
"Soy bean milk", pp. 213-217, gives results of feeding tests on albino rats, showing that soybean milk had about the same protein content as cow's milk, that other nutrient compounds were present to a lesser extent, that it curdled at a lower acidity than cow's milk, and that, in feeding, the ration containing soybean milk produced gain in weight less rapidly and with less efficiency than that containing cow's milk.
1237. Hepburn, Joseph S., and Sohn, Keun Sung. Do fu: an oriental food. Amer. Jour. Pharm. 102(10): 570. October 1930. 396.8 Am3  
This is a soybean preparation.
1238. Hill, Lewis Webb, and Stuart, Harold C. A soy bean food preparation for feeding infants with milk idiosyncrasy. Amer. Med. Assoc. Jour. 93(13): 985-987. Sept. 28, 1929. 448.9 Am37  
Gives the result of feeding infants upon a soybean formula.
1239. Holmes, Arthur D. Digestibility of protein supplied by soy-bean and peanut press-cake flours. U. S. Dept. Agr. Bull. 717, 28pp. Washington, D. C.; 1918. 1 Ag84B  
It is concluded that "the data obtained in this and other investigations give sufficient evidence to justify the belief that

soy-bean and peanut flours, rich in proteins that are well digested and of high biologic value, should prove especially valuable additions to the human dietary."

There is an abstract of this paper in Internatl. Inst. Agr. Internatl. Rev. Sci. and Pract. Agr. 10(7-9): 810-811. July-September 1919. 241 In82

1240. Holmes, Arthur D. Digestibility of some seed oils. U. S. Dept. Agr. Bull. 687, 20pp. Washington, D. C., 1918. 1 Ag84B  
Soy-bean oil, pp. 6-9.

1241. Holmes, Arthur D. Digestibility of stean-cooked soy beans and peanuts. Amer. Med. Assoc. Jour. 74(12): 798-801. March 20, 1920. 448.9 Am37

"The results of this investigation, considered in connection with the previously reported data regarding the nutritive and biologic values of these two legumes, give evidence to justify the belief that soy beans and peanuts are expecially valuable for human food, as compared with other legumes that have been studied with the same thoroughness."

1242. Hornemann, Curt. Über den vitamingehalt der sojabohne. Zeitschrift für Untersuchung der Nahrungs- und Genussmittel 49(3): 114-120. March 1925. 384 Z39

It is said in summary that, from the studies made, soybeans have been found to contain vitamin A, which is also present in the oil; that the soybean by-products, soyneal or cake, contain vitamin B; and that the proteins of soyneal and cake have been judged of high value when fed to rats.

1243. Horowitz-Wlassowa, L. M., Oberhard, I. A., and Gutermann, B. I. Ueber die zubereitung der sojanilch. Moscow. Zentrales Biochemisches Forschungs-Institut der Nahrungs- und Genussmittelindustrie. Schriften 1(5): 157-169. 1931. 389.9 M85

Text in Russian with alternate titles and summary in German.  
Method of preparing soybean milk.

Abstract by Schönfeld in Chemisches Zentralblatt 103(band 2) (3): 1985. Sept. 28, 1932. 384 C42

1244. Horowitz-Wlassowa, L. M., and Livshitz, M. I. Ueber die zubereitung des kefirs und des kases aus der sojanilch. Moscow. Zentrales Biochemisches Forschungs-Institut der Nahrungs- und Genussmittelindustrie. Schriften 1(5): 170-174. 1931. 389.9 M85

Text in Russian with alternate titles and summary in German.  
Method of preparation of "kephir" and cheese from soybean milk.

1245. Horvath, A. A. Acceptance of soya flour depends on correct processing. Food Indus. 7(1): 15-16. January 1935. 389.8 F737

"Improvements in process avoid a bean-flavored product, enhance keeping quality, and provide food manufacturers with an ingredient high in protein, rich in fat, and low in carbohydrates to complement starchy flours and supplement milk in food formulas." - Ed. note.



1246. Horvath, A. A. Changes in the blood composition of rabbits fed on raw soy beans. Jour. Biol. Chem. 68(2): 343-355. May 1926. 381 J824  
Bibliography, p. 355.
1247. Horvath, A. A., and Chang, H. C. The effect of soybean feeding on the blood lipase of rabbits. Amer. Jour. Physiol. 78(1): 224-234. Sept. 1, 1926. 447.8 An3  
Bibliography, p. 234.  
"From the Department of Medicine, Peking Union Medical College, Peking, China."  
Results of feeding experiments.
1248. Horvath, A. A., and Liu, Shin-Hao. The effect of soy sauce on blood sugar and phosphorus. Japan Med. World 7(4): 105-108. April 15, 1927. 448.8 J27  
Bibliography, p. 108.  
"1. In rabbits, subcutaneous injections of Taka-Diastase gives no definite results for conclusions, but seems to be capable of affecting the blood sugar in both directions. 2. In men the results of oral administration of soy sauce are varying and at present no definite conclusion concerning the effect of soy sauce on blood sugar and phosphorus can be drawn. But in some cases soy sauce seems to be capable of affecting the blood sugar and blood phosphatides." - Summary, p. 108.
1249. Horvath, A. A. Newer methods of refining soya oil preserve its food value. Food Indus. 7(8): 387-388. August 1935. 389.8 F737  
References, p. 388.  
A diagram illustrates the Bochn system of extracting soybean oil. The food value of the oil extracted by this method is described.
1250. Horvath, A. A. Some recent views about soya flour. 10pp. [1935?] Pan. Coll. 389 H  
Bibliography, pp. 9-10.  
The author quotes recent authorities in a discussion including the objectives of "processing" soybeans for the manufacture of edible flour, the quantity of lecithin, vitamins A and D and protein in the flour, its basic ash quality, alkaline influence and importance of these in the human diet.
1251. Horvath, A. A. Soya flour as a national food. Sci. Monthly 33: 251-260. September 1931. 470 Sci23  
The writer feels that "it should take but a very short time for the use of soya meal to become universal since it has five times the calorific value, and two hundred times the fat value of potatoes. It should become a national food in every sense." He discusses the chemical make-up of the soybean, and studies with soybean flour that have been made.

Also published, in Spanish, under title "El Frijol 'Soya' como Alimento Nacional." Revista de Agricultura, Comercio y Trabajo [Cuba] 14(3): 43-56. September 1932. 8 Ag88Re

1252. Horvath, A. A. Soya flour is miller's best friend. Amer. Miller 63(10): 36-37. October 1935. 298.8 Am32

"From the presented data it is evident that the best way to sustain and promote the consumption of wheat in the United States consists in shifting the wheat products from the class of energy producing foods to a level of full value foods. This can be easily done by the incorporation of a certain percentage of whole soya flour into the existing wheat products, such as bread, macaroni, etc."

1253. Horvath, A. A. Soya flour; its manufacture and uses. Food Manfr. 10(8): 279-281. August 1935. 389.8 F736

Processing, the probable effect upon bread consumption of use of soy flour, the food value of soybean bread, soybean flour in beverages and other products, and its nutritive value, are discussed.

1254. Horvath, A. A. The soybean. Coop. Manager and Farmer 21(2): 38-40. October 1931. 280.8 C78

Address delivered at the laboratory of the Harshaw Chemical Company, Cleveland, Ohio, May 24, 1931.

The author describes the food value of the soybean and its oil, the utilization of the bean in milk and soy sauce, and the uses for soybean flour and oil. He concludes that the "Soybean is going to revolutionize nutrition."

1255. Horvath, A. A. The soy bean as human food. Indus. and Engin. Chen., News Ed. 9(9): 136. May 10, 1931. 381 J825

The writer gives the historical background of the soybean, its chemical properties and uses, and the growing interest in soybean preparations in different countries. He proposes the establishment of "a soya foundation in order to promote the creation of a national soya food research institute."

1256. Horvath, A. A. The soybean as human food. Ed. 2, 86pp. Shanghai, China Ministry of Industry, Commerce and Labor, Bur. of Industrial & Commercial Information [1926] (Booklet series no. 3) 280.9 C44 no. 3

Bibliography, pp. 85-86.

Partial contents: Preface, by Macey F. Deming [Address at a meeting of the National Soybean Growers' Association held at Washington, D. C., September, 1925.], pp. 1-5; General ingredients of the various Manchurian beans, pp. 9-15; Composition of some Japanese soybeans and of the common American varieties, p. 16; The value of the soybean as food, pp. 17-20; Soybean oil for food, pp. 21-25; Refined soybean oil, pp. 26-29; The whole soybean as food, pp. 30-38; Soybean cake, soybean meal and soybean flour for food, pp. 39-57; Soybean milk for food, pp. 58-71; Soybean curd



- (tofu) for food, pp. 72-77; Fermented soybean products for food, pp. 78-83.

Also published as a series of articles in Chinese Economic Monthly 3(9): 392-400; (11): 513-518. September, November 1926. 269.1 C442

Continued in Chinese Economic Journal 1(1): 24-32; (2): 175-192; (3): 298-309; (4): 415-425. January-April 1927. 280.8 C442

1257. Horvath, A. A. Soybean feeding and blood calcium. Japan Med. World 8(1): 1-5. Jan. 15, 1928. 448.8 J27  
Bibliography, pp. 4-5.  
"...Raw cooked soybeans can restore a lowered blood calcium, caused by bleeding, in rabbits." - Summary, p. 4.
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1330. Oshima, Kokichi. Promising development of soya bean sauce. Amer. Food Jour. 17(1): 30-31. January 1922. 389.8 Am33

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1331. Park, Jay B. Soybeans for human food. Ohio Farmer 139(20, whole no. 3610): 687. May 19, 1917. 6 Oh3

The high food value and inexpensiveness of soybeans are discussed. Ohio farmers are urged to plant them, to meet the demand for increased food production.

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"The biological values of the proteins of mung bean, peanut and soy bean curd are 58, 59 and 65 respectively. The coefficient of digestibility of mung bean, peanut and soy bean curd are 86, 95 and 96 respectively." - Summary, p. 433.

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1341. Reid, Eric. The calcium, phosphorus, and nitrogen retention of rats on soybean-egg powder and whole milk powder diets. Chinese Jour. Physiol. 9(4): 307-314. Nov. 15, 1935. 447.8 C44  
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"(From the Division of Physiological Science, Henry Lester Institute of Medical Research, Shanghai.)"

Literature, p. 41.

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1343. Reid, Eric. A preliminary report on the preparation of an infant food, a soybean milk - egg powder. Chinese Jour. Physiol. 8(1): 53-64. March 15, 1934. 447.8 C44

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"Literature", p. 63.

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1345. Rhoad, A. O., and Carneiro, Geraldo G. Valor da soja moída para produção de leite. Boletim de Agricultura, Zootecnia e Veterinaria [Minas Geraes, Brazil.] 7(2): 69-78. February 1924. 9.2 M66  
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1346. Rimini, Enrico. Il pane e le paste alimentari pei diabetici. Archivio di Farmacologia Sperimentale e Scienze Affini 1(1): 30-46; (2): 66-79. January-February 1902. Army Medical Library.

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"What is the co-efficient of digestibility of the bean 'milk' proteins? What is the rate of storage of its protein nitrogen? To what extent do the Ca and P contents in the bean milk meet the requirement of a growing child? Metabolism experiments have, therefore, been conducted in an attempt to gather data on these points."
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Contribution from the States Relations Service.  
"Experiments with the soy-bean flour in the experimental kitchen of the Office of Home Economics show that palatable dishes can be made using this as one of the ingredients. Some of these tested recipes are given in this circular."

1396. U. S. Department of agriculture, Bureau of plant industry, Division of forage crops & diseases. Firms manufacturing or handling soybean food products. 2pp., processed. [Washington, D. C.] July 1936. Pam. Coll. - Soybeans.  
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"[From the New Jersey Agricultural Experiment Station, New Brunswick, N. J.]"  
"This extract can be very cheaply prepared and it may take the place, when properly modified by the addition of necessary salts, of meat extract and other digested meats in infant feeding and, since the soy bean contains very little carbohydrate and even the small amounts present are used up by the fungus, in the process of development, for energy purposes, the extract is practically free from sugars and can be introduced into diabetic cookery."



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"(From the Department of Biochemistry, Peiping Union Medical College, Peiping.)"  
Literature, p. 40.  
"The relative B<sub>1</sub> and B<sub>2</sub> contents of dried soybeans and cow's milk powder (Klim) were determined by feeding experiments with rats. The results confirm the finding of other workers that the soybeans are richer in vitamin B<sub>1</sub> than in B<sub>2</sub> and that the reverse is true of milk. Soybeans contain only 2/3 as much B<sub>2</sub> but three times as much B<sub>1</sub> as Klim." - Summary, p. 38.
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"(From the Department of Biochemistry, Peiping Union Medical College, Peiping.)"  
"It is evident...that before soybean milk can be recommended as a general substitute for cow's milk, further work is necessary.  
"We have therefore conducted some further experiments to compare soybean milk with cow's milk and repeated some of Tso's experiments."  
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"Because of the unique nutritive value of soybeans and the rapidly increasing acreage of them grown in the United States for farm and industrial purposes, the possibility of their becoming a more important food in the American diet has for some years been an interesting conjecture. One problem has been to ascertain which among the most promising varieties might prove acceptable to the American palate. This study, extending over the three crop years 1934, 1935, and 1936, was a step in this direction."

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PATENTS RELATING TO SOYBEAN PRODUCTS, AND PROCESSES

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1409. Albers, George. Soybean flour and process of producing the same. U. S. Patent 1,684,654. Patented Sept. 18, 1928. Application date Nov. 14, 1925.
1410. Anderson, William C. Cereal treatment process [for soybeans, etc.]. U. S. Patent 1,850,123. Mar. 22, 1932. Application date Feb. 26, 1929.
1411. André, Emile André. Improvements in the treatment of oil seeds and the like. Brit. Patent 279,122. Jan. 17, 1929. Application date Oct. 17, 1927.
1412. Arnot, Robert. Hydrolisation of casein or casein-containing bodies [from soya-beans, etc.]. Brit. Patent 306,168. Feb. 12, 1929. Application date Nov. 12, 1927.
1413. Asari, Tugio. Preservation of soy beans. Japanese Patent 101,895. July 7, 1933. Addn. to 90,218.
1414. Baile, Roland P. New food and process of production. U. S. Patent 1,615,822. Feb. 1, 1927. Application filed Dec. 20, 1923.
1415. Banks, Harry P. Process of making a water resistant adhesive and to the product thereof. U. S. Patent 1,813,377. July 7, 1931. Application date Jan. 26, 1929.  
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INDEX

<u>Item</u>	<u>Item</u>
Abbott, J. B.: Soybean in Massachusetts.....1	Affiliated broadcasting co.....495
Abbott laboratories, Chicago, Ill.....1444	Agcaoili, F.: Soja-bean curd, an important Oriental food product. With H. D. Gibbs.....1224
Adams, F. H.....399	Ageev. Mekhanizatsiia i agrotekhnika soi. With Itskov and Vainman.....101
Adams, G. E.: Soy bean.....2	Agnoli, Di Renzo Contenuto in vitamina A e B delle farine di lenti, di avena e di soja. With Laura Untersteiner.....857
Adams County, Ill.....827	Valore alimentare della farina di soja nella nutrizione dei giovani animali. With Laura Untersteiner.....858
Adhesives patent.....1459,1519 waterproofing, patent.....1452 <u>See also</u> Soybean adhesives	Agricultural chemical society of Japan Digestion experiment of soy bean cake and kaoliang with poultry..1143 [Nutritive value of soya- bean cakes].....722 [Nutritive value of soy- bean cake for hens. II.].....1144 [Nutritive value of soy- bean cakes].....1377 [Soybean cake as a food]...934 [Soy-bean cake for the fattening of swine]....1108 [Soy-bean oil cake as a food and its nutritive value] I-II.....1264 III.....1265 [Utilization of the by- products in the preparation of soy-bean oil by the alcohol-extraction method].....684 vitamin D. IV.....1267
Adkins, D. M.: Soya-bean problem.....491	
Adler, M.: Manufacture of soya- bean, milk and its derivatives. (patent).....1408	
Adolph, W. H. Additional notes on soy-bean products. With G. M. Wu.....1163	
Bone building potency of soy bean diets. With Shen-Chao Ch'en.....1194	
Digestibility of the protein of soybean milk. With Ying-Lai Wang.....1164	
4000-year food experiment....1165	
Hemoglobin-building properties of soy bean products. With Hsueh-chung Kao.....1166	
How China uses the soy bean as food.....1167	
Nutritive value of soy-bean products. With P. C. Kiang.....1168	
Utilization of calcium in soy bean diets. With Shen- Chao Chen.....1169	
Adriano, F. T.: Physical characteristics and chemical com- position of various brands of toyo (soy sauce) sold in the Philippines. With S. B. Oliveros, D. S. Santos, and E. R. Villanueva.....1170	

Item

Agricultural products used in  
automotive industry, in-  
creasing.....48

Agricultural recovery, aided by  
soybean.....92

Agriculture, and industry  
cooperation.....48,594,623

linked by soybeans.....73

Alabama.....34,343,964,1061

Alabama Agricultural experiment  
station

Growing soy beans in  
Alabama.....34

Soybean hay as a supplement  
to white corn and tankage  
for growing and fatten-  
ing hogs.....1061

Soy beans in Alabama.....34

Vetch, cowpea, and soy  
bean hay as substitutes  
for wheat bran.....964

Alabama. Agricultural experiment  
station, Department of  
agronomy and soils. Soy-  
beans.....343

Albers, George.: Soybean flour  
and process of producing  
the same (patent).....1409

Albrecht, W. A.

Changes in composition of  
soybeans toward maturity  
as related to their use as  
green manure. With W. H.  
Allison.....739

When to cut soybean hay.....344

Alekseeva, P. I.: Nutrient value  
of edible fats and oils. With  
A. K. Pickat, N. S. Zenin,  
and O. Kurtsina.....1335

Alexander, B. H.: Soy-bean paste  
as an emulsifying agent. With  
A. M. Field and E. B. Syl-  
vanus.....1220

Alexandrow, W.: Die vergleichenden  
untersuchungen über die methodik  
der asche- und phosphorbestim-  
mung in den sojabohnen. With  
A. N. Lebedev.....432

Item

Alfalfa

as forage for fattening  
hogs, compared with  
permanent pasture and  
green soybeans.....1054

feed value  
compared favorably with  
soybeans, Kansas.....303

for dairy heifers, compared  
with soybean hay.....988

lands too acid for, grow  
soybeans.....303

replacement by soybeans.....913

shortage, supplemented with  
soybeans, Kansas.....303

Vermont.....520

Alfalfa hay, as feed.....894

calory content.....967

compared with soybean hay..299

compared with soybean  
hay.....126,198,957

digestible nutrients lower  
than soybean hay.....957

for dairy cattle  
compared with soybean  
hay.....955,957,960,1000

could be replaced by soy-  
bean hay.....988

substitute for purchased  
feeds.....992

superior to soybean and  
clover hays.....975

with cracked soybeans, corn  
silage, cracked corn  
and ground oats.....998

with soybeans and linseed  
oilmeal.....979

for draft fillies, equalled  
by soybean hay.....1124

for sheep.....1153

compared with soybean  
hay.....1151,1153,1161

net energy value See Alfalfa  
hay, as feed, calory content

protein roughage, compared  
with soybean hay.....1019

vitamin A value.....982



<u>Item</u>	<u>Item</u>
Alfred, Schwicker.....1216	American milling co. <u>See</u> Allied
Alkali, utilization in food	mills, inc.
product, patent.....1521	American oil chemists' society.
Allen, P. W.: Industrial	Soy bean analysis committee...645
fermentations.....1171	American oil chemists' society,
Allied mills, inc., Chicago,	Soybean oil refining com-
Ill.....868,952,1131,1234	mittee, report.....730
Allied mills, inc., Peoria,	American pharmaceutical association.
Ill., soybean elevator....402,488	Soybeans and soybean oil.....524
Allied mills, inc., Portsmouth,	American society for testing
Va., soybean plant.....45,229	materials. Practical testing
Allis-Chalmers Manufacturing	of drying and semi-drying
co., Milwaukee. Versatile	paint oils.....670
soy bean.....3	American society for testing
Allison, W. H.: Changes in	materials. Sub-committee III
composition of soybeans toward	of Committee D-1.
maturity as related to their	Hexabromide test for deter-
use as green manure. With	mining purity of linseed
W. A. Albrecht.....739	oil.....632
Allyn, O. M.: Soybeans and cowpeas	instructions on hexabromide
in Illinois. With W. L.	tests for determining
Burlison.....26	purity of soybean and
American chemical society.	linseed oil.....664
Changes that occur in the	American society of agronomy.
proteins of soybean meal	Bar-cylinder soybean thresher.370
as a result of storage....483	Economic study of harvesting
Utilization of soya beans....493	soybeans for seed.....378
American chemical society, Division	Effect of growing corn and
of agricultural and food	soybeans in combination
chemistry. Symposium on the	on the percentage of dry
chemistry and technology of	matter in the two crops....947
soybeans.....735,1212	Effect of soil type and
American cotton oil co., New	fertilizer treatment on the
York, N. Y.....1556	composition of the soybean
American farm bureau federation.	plant.....860
Interchangeability of oils	Effect of Sudan grass and of
and fats. Report.....494	soybeans on the yield of
American medical association.	corn.....851
Digestibility of steam-	Environmental factors affecting
cooked soy beans and	the protein and the oil
peanuts.....1241	content of soybeans and
Soybean as an article of diet	the iodine number of soybean
for infants.....1356	oil.....443
Soybean food preparation for	Fluctuating variations in the
feeding infants with milk	soy bean.....433
idiosyncrasy.....1238	Pole beans versus soybeans as
Soybean milk in infant	a companion crop with corn
nutrition.....1369	for silage.....948

<u>Item</u>	<u>Item</u>
American society of agronomy - Cont'd.	American society of animal
Reduction of soil nitrates	production - Continued
during the growth of soy-	Soft pork - cornbelt....1116
beans.....766	Soft pork from the market
Soil erosion of soybean land..769	standpoint.....1102
Soybeans in the northeast.....849	Soybean hay for the
Studies of soybeans and other	Breeding ewes.....1151
green manure crops for	Soybean oil meal and other
sugarcane plantations.....740	plant protein rations
symposium on "The forage	for pigs supplemented
problem".....894	with limestone and bone
Time of harvesting soybeans	meal.....1037
for hay and seed.....390	Soybean oil meals prepared
Vitality of soybean seed as af-	at different temperatures
fected by storage conditions	as feed for pigs.....1065
and mechanical injury.....486	Soybeans and soybean
American society of animal pro-	oilmeal as supplements
duction	to corn for hogs.....1090
Effect of ingesting soy-	Wheat and soybeans as a
beans and oils differing	feed for swine.....1111
widely in their iodine	American soya products corporation,
numbers upon the firm-	Evansville, Ind.....1437-1440
ness of beef fat,.....1023	American soybean associa-
Effect of soybeans upon	tion.....4c,548
the firmness of beef	annual meeting
fat.....1024	1923 (résumé). ....225
Effects of soybeans and	1924.....226
soybean products on	1932.....222
pork quality.....1114	list of soybean products
Expeller processed soybean	exhibited.....80
oil meal compared with	Mid-State soybean associa-
other protein supple-	tion and the Dun-
ments.....1049	field.....4a
Feeding of soybeans to	Proceedings, 1925/27-
hogs in definite pro-	1930; 1935-[1937].....4
portions and their effect	Ammonium sulphate, compared with
upon the quality of	soybean oilcake as substitute
pork.....1066	for peptone; in nutrient
Influence of the method	media.....585
of oil extraction on	Amoureux, G.: Sur les avantages de
the feeding value of	la peptone pepsique de
soybean oilmeals.....924	tourteau de soya pour la prépa-
Machine dried versus field	ration des milieux de culture.
cured soybean hay for beef	With Albert Berthelot, and
steers.....1017	F. van Diense.....571
Nutritive value of soybeans	Anderson, R. H.: Industrial uses
with preliminary observa-	of the soybean.....495
tions on the quality of	
pork produced.....1115	



<u>Item</u>	<u>Item</u>
Anderson, W. C.: Cereal treatment process [for soybeans, etc.] (patent).....1410	Arnold, L. K.: Processing the soybean. With O. R. Sweeney.....251
André, E. A.: Improvements in the treatment of oil seeds and the like. (patent).....1411	Arnold, P. T. D.: Soy beans for silage. With R. B. Becker, W. M. Neal, and C. R. Dawson.....864
Andrović, Edwino: Studi teorici e pratici sull'olio di semi di cotone e di semi di soya..1172	Arnot, Robert: Hydrolisation of casein or casein-containing bodies [from soya-beans, etc.] (patent).....1412
Anemia, nutritional, in rats and mice, effect of proteins upon.....1333	Army, A. C. Grow more soybeans in Minnesota. With R. E. Hodgson.....5
Annen, H.: Die sojabohne.....1173	Soybeans for Minnesota. With W. W. Brookins, and R. E. Hodgson.....5
Anthony, E. L.: Soybean vs. alfalfa hay for milk production. With H. O. Henderson...955	Soybeans for Minnesota. rev. With R. F. Crim and R. E. Hodgson.....5
Arachis nut <u>See</u> Peanut	Asari, Tugio: Preservation of soy beans. (patent).....1413
Arbuckle, W. S.....1030	Asia.....130
Arceneaux, George: Studies of soybeans and other green manure crops for sugarcane plantations. With Nelson McKaig, Jr., and I. E. Stokes.....740	Aso, K.: Ueber die chemische zusammensetzung der japanischen soja-sauce oder "schōyu." With U. Suzuki, and H. Mitarai.....1378
Archer-Daniels Midland co., Milwaukee, Wis.....1471	Association of Chinese and American engineers. Soybean oil as soap making material.....680
Archer-Daniels-Midland co., Milwaukee, Wis., Soybean division. 44% protein. New process soybean oil meal and soybean flakes.....859	Association of southern agricultural workers. Comparative values of peanut and soybean hay for milk production...970
Archer-Daniels-Midland co., Minneapolis, Minn., contract forms for soybeans.....400	Comparison of alfalfa hay and soybean hay with and without mineral and cod liver oil supplement.....988
Argentina. Ministerio de agricultura, Dirección general de enseñanza agrícola. La soja hispida y sus aplicaciones.....554	Effect of variety, maturity and soundness on certain soybean seed and oil characteristics.....440
Arkansas.....24,34,140,180, 343,964,1061,1077	
Arkansas. Agricultural experiment station. Use of forage crops for growing and fattening swine.....1077	
Arkansas. University. College of agriculture, Extension division. Soybeans:.....24,180	

<u>Item</u>	<u>Item</u>
Association of southern agricultural workers - Continued	Baile, R. P.: New food and process of production. (patent).....1414
Hogging down corn and green soybeans.....1033	Bailey.....668
Molasses as a preserving agent in making soybean silage.....881	Bailey, E. M.: Carbohydrates and the enzymes of the soy bean. With J. P. Street.....1375
Peanut versus soybean hay for dairy cattle.....972	Bailey, L. H. Composition and characteristics of soybeans, soybean flour, and soybean bread. With R. G. Capen, and J. A. LeClerc.....1174
Soybean varieties newly developed for U. S. farms.....172	Soybeans and soybean flour and the effect of storage conditions upon the composition of soybeans. With J. A. LeClerc.....4d
Utilization of power and power equipment in corn and soybeans.....320	Bailey, S. W.: Soy beans for hay and silage.....862
Austin, R. H.: Effect of soil type and fertilizer treatment on the composition of the soybean plant.....860	Bailey's proposed method for testing purity of linseed oil.....664
Austria.....1336, 1408, 1421, 1422, 1424, 1425, 1608, 1609	Baker, O. E.: Graphic summary of farm crops. With A. B. Genung.....447
Automotive industry uses of agricultural products in, increasing.....48	Balland. Le soja dans l'alimentation française...1175
See also Soybeans, uses, in automotive industry	Ballard, J. M.....1076
Ayres, W. E. Much feed at little cost.....6	Bankhead-Jones act, founding of research laboratories under principles and procedure.....589
Soybeans: Delta branch station.....741	Banks, H. P. Adhesive from soybean flour. With Glenn Davidson, C. N. Cone, and I. F. Laucks. (patent).....1455
Soybeans in the Mississippi Delta.....4	Cellulose-fiber product treated with a size embodying soy-bean flour and process of making the same. With Glenn Davidson, H. F. Rippey, C. N. Cone, and I. F. Laucks. (patent).....1456
Babcock, S. H., Jr.: Beneficial effect of non-saponifiable fraction of soy bean oil on chicks fed a simplified diet. With T. H. Jukes.....1126	
Bacharach, A. L.: Growth-promoting properties of vitamin D.....861	
Bacon flabby, caused by soybeans...1109	
smoked and cured, from hogs fed soybeans, commercially satisfactory.....1115	
See also Pork	



<u>Item</u>	<u>Item</u>
Banks, H. P. - Continued	Barney, F. C.: I'd feed ground
Plastic composition and	soybeans to a dairy herd....956
method of making same.	Barr, H. T.: Corn and soybean
With I. F. Laucks, Glenn	production.....305
Davidson, H. F. Rippey,	Barr, J. E.....231
and C. N. Cone (patent)...1504	Development of quality
Pressed soya bean oil.	standards for soybeans.....4
With I. F. Laucks.....1293	development of soybean
Process of making a water	inspection.....223
resistant adhesive and to	Marketing soybeans basis
the product thereof.	U. S. standards.....328
(patent).....1415	Seedsmen and the soybean
Process of preparing soya bean	industry.....8
protein containing material	Soybean industry and United
for the manufacture of an	States standards.....4
adhesive, and the product	Soybean industry is rapidly
thereof. With L. W.	developing in United
Eilertsen, C. N. Cone,	States.....496
Glenn Davidson, and I. F.	Soy-bean standards promulgated
Laucks (patent).....1466	for commercial crop.....329
Bardet. Sur un pain sans	Soybeans: the basis of a
matières amylacées à base	new industry.....497
de soja hispida.....1176	Soy beans make good cash crop
Bardin, G. S., methods of harvest-	for Indiana farmers.....9
ing soybeans.....177	What price soybeans?.....569
Barley	Barry, D. T.: Advantages of growing
feed value for hogs.....1077	soya bean in Ireland. With
winter, in rotation with	J. Freud.....1178
soybeans.....840	Bartlett, J. M.: Soy beans in
Barlow, F. F.: Some interesting	Maine. With C. D. Woods....301
experiences with the soy	Bartlett Frazier co.....249
bean crop in New Jersey.....304	Baskett, R. G.: Role of
Barnard, H. E.....47	separated milk, soya bean
Possibilities of chemistry	meal and minerals in the
and agriculture.....186	nutrition of the chick.
Soy beans and products - their	With J. H. Prentice.....1141
uses in commercial feed-	Baton Rouge, La.....617
ing.....7	Baughman, W. F.: Oil content
Soybeans and the Farm chemurgic	of nine varieties of soybean
council.....4d	and the characteristics of
Soybeans in commercial	the extracted oils. With
feeding.....7	G. S. Jamieson and R. S.
Barnard, H. L.: Value of the	McKinney.....428
soybean.....568	Bayer, F., and co., Elberfeld,
Barnett, E.: Corn and soy beans	Germany.....1501
for pork production. With	Beadles, J. R.: Soybeans found
C. J. Goodell.....1035	richer in certain vitamins than
	corn. With H. H. Mitchell..916

<u>Item</u>	<u>Item</u>
Bean curd <u>See</u> Soybean curd	Beckel, A. C.: Protein plastics from soybean products. With G. H. Brother and L. L. McKinney.....570
Bean flour <u>See</u> Soybean flour	Becker, Christian: Soja bei eitrigen harninfektionen, ekzem und diabetes.....1177
Beans	Becker, R. B. Chemical study of ensiling soybeans. With W. M. Neal.....918
boiled, treatment, process, patent.....1491	Soy beans for silage. With W. M. Neal, C. R. Dawson and P. T. D. Arnold.....864
dry	Bedenbaugh, P. G.: Grazing and feeding trials with corn and soybeans for pork production.....1036
outlook charts.....467-468	Beef
pellagra-preventive action.....1228	food value, with reference to vitamin B, compared with egg white and dried soybean curd.....1193
field, yield compared with soybeans and cowpeas.....784	lean, amino acid deficiency for growth in white rat.....1311
navy, competition with soybean.....1232	production; cheap through soybeans.....867
pole, with corn for silage, compared with soybeans.....948	<u>See also</u> Meat
soy <u>See</u> Soybeans	Beemer, A. W.....287
velvet.....469, 472-474	Beeson, K. E. Solving "soy" problems.....345
Beard, F. J.....1083	Soy beans as a crop and feed.....865
Influence of soybeans upon the gains, feed requirements, and character of the fat produced when fed to growing and fattening spring pigs on rape pasture. With C. C. Culbertson, B. H. Thomas, and W. E. Hammond.....1045	Soybeans for Indiana farms...10
Beard, Fred: Effect of ingesting soybeans and oils differing widely in their iodine numbers upon the firmness of beef fat. With B. H. Thomas and C. C. Culbertson..1023	Soybeans in Indiana.....4
Beaufour, Henri: Process for the extraction of the albumino-caseins of vegetable origin and for the separation of such albumino-caseins from anylaceous matter (patent)...1416	Belden, L. A.: Soybean hay for horses.....1122
Beaumont, A. B.: Soybeans for Massachusetts. With R. E. Stitt.....863	Belen'kii, D. E. <u>See</u> Belenky, D. E.
Beavers, J. C.: Soybeans with corn.....742	Belenky, D. E. Bacterial method of obtaining "to-fu". With N. N. Popova.....536
Bechdel, S. I.: Soybean hay for milk production.....957	[Cheese from soy milk.] With N. N. Popova (patent)...1417



<u>Item</u>	<u>Item</u>
Belenky, D. E. - Continued	Berczeller, Lázló - Continued
Koumyss from soybean milk.	Process for the manufacture
With N. N. Popova.....536	of soya bean flour
New sources of national	(patent).....1422
food supply.....536	Process for working up
Soybeans as a meat substitute	natural materials contain-
in microbiological	ing lecithin [from soya
practice.....536	beans]. (patent).....1422
Bellwood, R. A.: Method or	Treatment of soy beans.
process of extracting oil	(patent).....1423
from vegetable seeds, nuts,	Ueber die biologische wertung
and the like. With Charles	der nahrungsmittel.....1179
Downs and T. W. Turnill.	Die untersuchung des
(patent).....1464	sojamehles.....1180
Beltzer, F. J. G.	Verfahren zur veredelung von
Études sur la caséine végétale	sojabohnen (patent).....1424
du "soja" et ses applica-	Berczeller, Selma: Verfahren
tions.....498	zur veredelung von öl bzw.
Industries du lactose et de	koagulierbares eiweiss
la caséine végétale du	enthaltenden produkten.
"soja".....499	(patent).....1425
Le lait végétal, la caséine	Berczeller's Soybean flour <u>See</u>
végétale et les produits	Soybean flour
industriels retirés des	Bergey, Nestor: Improvements
graines de "soja".....500	in the treatment of soya
Belyaev, N.: Use of soybean	beans for their conversion
oil in paints.....633	into food products.
Benton, R. H., Jr.: Soy bean	(patent).....1426
cultivation.....11	Bermuda. Dept. of agriculture.
Berczeller, Lázló	Soy beans and cowpeas for
Arbeiten über das Berczeller'sche	soil improvement.....743
sojamehl (cited).....1178,	Berthelot, Albert: Sur les
1216,1332,1367	avantages de la peptone
Artificial milk. With R.	pepsique de tourteau de soya
Graham (patent).....1418	pour la préparation des
Die bedeutung der soja für	milieux de culture. With
die volksernährung.....1178	G. Amoureux and F. van
Das ernährungsphysiologische	Deinse.....571
laboratorium in Wien.....1178c	Biazzo, R.: Sulla determinazione
Improved process for treating	del contenuto in olio dei
soya beans. (patent).....1419	semi oleosi.....12
Improving soya beans. With	Bibbins, A. L.: Soy beans
R. Graham (patent).....1420	make a sure hay crop.....866
Process for preventing the	Bierman, H. R.: Soybean hay vs.
oxidation of soya beans	wheat bran and mixed hay
and bran obtained therefrom	in milk production.....809
(patent).....1421	

<u>Item</u>	<u>Item</u>
Bierman, Harlow: Soybeans: production, composition and feeding value. With J. E. Metzger and M. G. Holmes.....809	Blokhuis, D. F.: Over de beteekenis van de sojaboon als handelsproduct. With E. R. Von Liebenstein.....61
Biggar, H. H.: Soybeans - South Dakota's new crop.....13	Blue grass, feed value for hogs.....1077
Bill, F. W.: Turning soy beans into money.....14	Blythe, S. O.: Selling soys....394
Bingham, A. B.: Use of soya bean oil in paste colors.....634	Boehm system of oil extraction1249
Bisbey, Bertha: Maintenance values for the proteins of milk, bread-and-milk, meat, and soy bean curd in human nutrition. With M. S. Rose and Grace MacLeod.....1349	Boerner, E. G.: Brown-Luvel moisture tester and how to operate it. With D. A. Coleman.....421
Bishop, W. B.: Soy bean flour. (patent).....1427	Bogatskii, V. D.: Technologie der herstellung und methoden der desodorierung der sojamilch. With M. K. Storozhuk and V. A. Muromtsev.....1182
Black, A. G.....336	Bohstedt, G. Effect of cystine and casein supplements upon the nutritive value of the protein of raw and heated soybeans. With J. W. Hayward and H. Steenbock.....1233
Black Hawk County, Iowa.....23	Effect of heat as used in the extraction of soy bean oil upon the nutritive value of the protein of soy bean oil meal. With J. W. Hayward and H. Steenbock.....1234
Blacktongue preventive action, 16 foodstuffs including soybeans.....1327	Feeding soybeans and soybean oil meal.....4d, 868
Blackwell, C. P.: Soy beans. With S. L. Jeffords.....15	Soybean oil meal and other plant protein rations for pigs, supplemented with limestone and bone meal. With J. M. Fargo and W. A. King.....1037
Blair, A. W. Factors influencing the protein content of soybeans. With J. G. Lipman.....435	Soybean oil meal prepared at different temperatures as a feed for poultry. With J. W. Hayward, J. G. Halpin, C. E. Holmes and E. B. Hart.....1131
Factors influencing the protein content of soy beans. With J. G. Lipman, H. C. McLean and L. K. Wilkins.....434	
Blauser, I. P.: Combines in Illinois. With E. W. Lehmann.....364	
Bledsoe, R. P.: Grille for threshing soybean selections..346	
Bliss, G. R.: Producing pork, beef and milk with soy beans..867	
Bloch, A.: Quelques mots sur la fabrication et la composition du Teou-fou (fromage de haricots chinois fourni par le soja hispida).....1181	



<u>Item</u>	<u>Item</u>
Bohstedt, G. - Continued	Bollmann, Hermann - Continued
Soybean oil meals prepared	Process of purifying
at different temperatures	phosphatides obtained
as feed for pigs. With	from oilseeds and the
J. W. Hayward and J. M.	like (patent).....1434
Fargo.....1065	Produit d'apprêt, d'encollage
Soys on a barnyard menu.....869	et d'adoucissement. With
Boidin, A. R.: Manufacture of	B. A. Rewald (patent)...1435
proteolytic enzymes by means	Verfahren zur verbesserung
of micro-organisms [utilizing	von pflanzenlecithin
soja cakes]. With I. A.	(patent).....1436
Effront. (patent).....1428	Bollmann method of lecithin
Bois, D.	extraction.....1235
Les plantes alimentaires chez	Bolton, E. R.
tous les peuples et à	Fatty foods. With Cecil
travers les âges.....16	Revis.....501
Le potager d'un curieux.	Oils, fats and fatty
With A. Paillieux.....16	foods.....501
Bokura, U.: Soy bean cake as a	Bone meal
substitute for peptone in	starting ration of chicks,
the preparation of the nutrient	nutritive value, compared
media. With S. Hori.....585	with soybean meal and
Boll weevil, ravages in cotton	meat.....1130
belt, may lead to larger	supplement to soybean oilmeal
place for soybeans.....188	in hog rations.....1037
Bollmann, Hermann	Bonotto, Michele
Improvements in and relating	Apparatus for treatment of
to the manufacture of	soya beans and other
aqueous emulsions con-	material. (patent).....1437
taining lecithin [from	Bread-leavening composition.
soya bean]. With B. A.	(patent).....1438
Rewald (patent).....1429	Process of making vegetable
Improvements in and relating	product (patent).....1439
to the production of thick-	Process of treating leguminous
ening materials for use in	materials. (patent).....1440
printing [from soya beans].	Bontoux, Émile: Le soja et ses
With B. A. Rewald	dérivés.....17
(patent).....1430	Bordakov, P. P.: Determination of
Manufacture of foodstuffs	the quality of soybean seeds536
[from oil-bearing seeds,	Bordas, Jean: Le soja et son
including soybeans].	rôle alimentaire.....502
(patent).....1431	Borkowski, Rudolf: Die entwicklung
Process for the purification	der production und des
of phosphatides (patent)..1432	internationalen handels an
Process of producing an	hülsenfrüchten.....503
article of food. (patent) 1433	Borkowsky, A.....1494

<u>Item</u>	<u>Item</u>
Borough oil and colour students' association.....624	Bran, compared with soybean hay and cottonseed meal.....960
Borst, H. L.	Bratzler, J. W.: Cystine deficiency of soybean protein at various levels, in a purified ration and as a supplement to corn. With C. L. Shrewsbury.....930
Corn and soybean combination. With J. B. Park.....744	Bray, C. I.: Hogging down corn and green soybeans.....1038
Experiments with growing corn and soybeans in combination. With J. B. Park.....745	Brazil.....51,77
Growing soybeans in corn. With J. B. Park and C. J. Willard.....818	Brazil. Instituto Nacional de Tecnologia.....51
Life history and composition of the soybean plant. With L. E. Thatcher.....347	Bread
Borushko, Michael: Soy-bean oil in the paint and varnish' industry.....635	and milk proteins, values, maintenance, in human nutrition.....1349-1350
Bottari, Fulvio: La soja.....18	balanced nutritionally.....1268
Bowden, Arthur: Use of soybean meal for adhesive purposes....636	brown versus white bread..1178a
Bowdidge, Elizabeth: Soya bean...504	containing carob or soy bean flour, patent.....1540
Bowers, W. G.	food value, increased by addition of soybean flour.....1178a
Digestibility of soy bean meal by man. With J. F. Lyman.....1305	for diabetics, patent.....1548-1549
Some studies on the nutritive value of the soy bean in the human diet.....1183	milk, made from soybean flour.....1178
Bowling, G. A.: Soy bean hay as a sole roughage for dairy cows. With L. F. Herrmann.....978	types produced with soybean flour.....1202
Boyd, A. R., New York, N. Y.....1605	<u>See also</u> Soybean bread
Boyer, R. A., new synthetic fiber from soybean protein....603	Bredemann, G.: Ueber den einfluss der lagerung der sojabohnen auf die extrahierbarkeit und die extraktionsgeschwindigkeit des oeles und der phosphatide. With H. Kummer.....479
Bradley, Clark: Processing of soy beans.....49	Breedlove, L. B.
Bradley, E. C.: Domestic production of soybean oil and oil meal....4	development of soybean production.....223
Bradley, I. C.	Food and industrial prospects for soybeans.....505
Processing of soybeans.....4d	Bressman, E. N.: Bet on beans.....19
Soy bean.....600	Brewers' grains, dried, and wheat bran in dairy ration, vs. cottonseed meal.....992
Brainin, David: Article of food and process of producing the same (patent).....1441	Briggs, G. M.....136
Braman, W. W.: Net-energy values of corn silage, soy-bean hay, alfalfa hay, and oats. With E. B. Forbes and Max Kriss....967	Grow soybeans.....20
	Making soy bean hay.....348



<u>Item</u>	<u>Item</u>
Briggs, G. M. - Continued	Brown, E. D.
Should we consider soy	Process of reducing the
beans.....746	water requirement of compo-
Soy bean jazz.....747	sitions of matter embody-
Soybeans - a good legume	ing vegetable protein con-
crop borrowed from the	taining material and to
Orient. With R. A. Moore	the product thereof. With
and E. J. Delwiche.....159	Glenn Davidson and I. F.
Soybeans and other supplementary	Laucks (patent).....1442
feed crops.....870	Protein product and process
Soy beans as an economical	of making. With C. N.
dairy feed.....958	Cone (patent).....1450
Brightman, R.: Note on a deposit	Brown, F. A.: Sudan grass and
in refined soya bean oil.....637	soy beans for hay crops.....871
Brinckmann, August: Process for	Brown, H. P.: Effect of soybeans
the production of stable	on corn yields.....748
water-containing emulsions	Brown, H. R.
of vegetable lecithin [from	Explosions reveal hazards of
soya beans]. With F. W.	soybean processing. With
Engelmann, M. J. Brinckmann,	D. J. Price.....703
Arnold Mergell, and Fritz	Glidden soybean plant ex-
Mergell (patent).....1467	plosion. With D. J.
Brinckmann, M. J.: Process for	Price.....703
the production of stable	Brown, L. C.: Soy beans aid
water-containing emulsions	balanced farming.....872
of vegetable lecithin [from	Brown, P. E.
soya beans]. With F. W.	Growing soy beans not desirable
Engelmann, Arnold Mergell,	on land subject to erosion
August Brinckmann, and Fritz	or blowing.....749
Mergell (patent).....1467	Soy beans not a soil building
Briscoe, H. W. A.: Modified oils.	crop.....750
With Sommer-Schmidding-Werke	Brown-Duvel moisture tester....421
Vertriebsgesellschaft m.b.H.	Bruce, W.: Report on cattle-
(patent).....1587	feeding experiments, 1909-
Brookins, W. W.: Soybeans for	1910.....959
Minnesota. With A. C. Army	Bryn, A. J.....1487
and R. E. Hodgson.....5	Buchanan, A. E., Jr.: Soybean
Broomcorn, outlook charts....467-468	flour.....1184
Brother, G. H.: Protein plastics from	Buer, H.: Process and apparatus
soybean products. With A. C.	for the preparation of a
Beckel and L. L. McKinney.....570	coffee substitute from soya
Brown, B. A.	beans. (patent).....1443
Corn and soybeans as a combi-	Bugby, William: Soy beans as
nation crop for silage.	human food.....1185
With W. L. Slate, Jr.....931	Bulgaria.....1275
El cultivo de la soja.....21	Bull, Sleeter.
Soy beans in Connecticut.	Effect of soybeans and soybean
With W. L. Slate, Jr.....22	oil meal on quality of pork.
.....	With W. E. Carroll, F. C.
.....	Olson, G. E. Hunt, and
.....	J. H. Longwell.....1039

Item

Bull, Sleeter - Continued	
Soybean test compares hogging-down vs. dry lot. With W. E. Carroll, R. A. Smith, and J. H. Longwell	1042
Soybeans and soybean products in pork production.....	4e
Soybeans not guilty.....	1040
Bunn, Abram: Soy beans - why not?.....	873
Burdick, A. S.: Vegetable milk. With Carl Nielsen (patent)...	1444
Burger, A. A.	
Is the soybean here to stay?..	751
Strayer grows soys.....	23
Burkholder, C. L.: Soybean flour.....	752
Burleson, D. J.: Soybeans. With C. K. McClelland.....	24
Burlison, W. L.....	231
Cutting soybean harvesting costs. With C. A. Van Doren.....	383
Fight the chinch-bug with crops. With W. P. Flint...	753
Production and utilization of soybeans and soybean products in the United States. With O. L. Whalin.....	25
Recent developments in the utilization of soybean oil in paint.....	638
Shrinkage of soybeans and soybean hay and soybean oil paint investigation.....	4b
Soybean.....	506
Soybean for plastics.....	572
Soybean production in Illinois. With J. C. Hackleman and O. H. Sears.....	86
Soybeans and cowpeas in Illinois. With O. M. Allyn.....	26
Soybeans gain popularity.....	27

Item

Burlison, W. L. - Continued	
Supply and marketing of soybeans and soybean products. With C. L. Stewart, L. J. Norton and O. L. Whalin.....	245
Utilization of soybean oil with special reference to paint.....	4c
Burnett, L. C.	
Soybeans in the cornbelt....	874
Soybeans on cornbelt farms..	754
Burns, C. C.: Farmers to market soybeans.....	395
Burr, R. A.: Bean that made Manchuria famous.....	28
Burruss, D. N., Jr.: Process of making casein [from soybean meal]. With J. P. Ruth (patent).....	1445
Burton, C. S.: Industrial magic in beans.....	639
Burt-Davy, Joseph: Soy-bean (glycine hispida).....	29
Bush, Guy: Soybean mills for Iowa.....	640
Butler, Eugene: Strong and weak points of soy beans and cowpeas.....	755
Butler, W. R.: Labor-saving soy.....	306
Butter	
marketing value lowered through undesirable flavor caused by soybeans.....	1001
nutritive value, compared with margarine and soybean oil, experiments on white rats.....	1335
quality, effect of soybeans, soybean oilcake and oilmeal fed to cows upon....	962, 985, 999, 1006, 1022, 1034
vitamin A activity, relation to vitamin A activity of hay fed to cows.....	982



<u>Item</u>	<u>Item</u>
Butter - Continued	Canada.....33,55,138,142,944,1492
vitamin A value, effect	Canada. Dept. of agriculture.
of soybeans in dairy	Soybeans.....55
rations on.....1027	Canadian industries ltd.....1492
Butterfat, yields, increased,	Cannon, C. Y.
method of obtaining.....987	Gastric digestion of soybean
Byerly, T. C.: Effects of light,	flour. With L. N.
soybean and other diet	Shoptaw and D. L. Espe..1012
supplements on seasonal	Production of dairy cows
hatchability and egg pro-	when fed only silage
duction. With H. W. Titus,	and cracked soybeans..
N. R. Ellis and R. B.	With N. K. Williams
Nestler.....1127	and D. L. Espe.....1031
Cacao-cake powder, extraction	Soybeans for dairy cows.
of oils and fats, apparatus	With Floyd Johnston.....961
and solvent system, patent...1557	Capen, R. G.: Composition and
Calcium	characteristics of soybeans,
added to soybean oilcake	soybean flour, and soybean
in poultry rations.....1145	bread. With L. H. Bailey
retention, rats fed on soybean	and J. A. LeClerc.....1174
egg powder diet.....1341	Capone, Giorgio: Oleaginous
utilization in soybean	products and vegetable oils;
diets.....1169	production and trade. With
Caldwell, R. E.	Ivan Grinenco.....448
Test of three protein con-	Cappelli, Giuseppe: Sul pane
centrates and two leguminous	con soia e di soia.....1187
roughages in milk production.	Carbon tetrachloride poisoning
With O. F. Hunziker.....986	in animals, research.....926
Value of soybean and alfalfa	Cardwell, G. A.: Why not
hay in milk production....960	soybeans?.....756
California.....232,1583	Carles, P.: Le lait
Calland, J. W.	végétal.....1188
Soybeans a coming crop.....30	Carmean, T. M.: And now -
What about soybeans?.....30	soybean flour.....1189
Calves, dairy	Carmichael, B. E.....823
fed linseed oilmeal.....981	Soybean pasture for fatten-
fed soybean flour.....1012	ing hogs.....1041
as substitute for cows'	Garminati, Giulio: La soia e
milk.....1013-1014	la lana artificiale?.....507
fed soybean oilmeal.....981	Carnegie institution of
fed soybeans.....886	Washington. Continuation
See also Cattle, dairy	and extension of work on
Campbell, J. T.: Growing	vegetable proteins.....1326
popularity of soybeans.....31	Carneiro, G. G.: Valor da soja
Campbell, Mabel: Soy bean - a	molda para producao de
little known legume.....1186	leite. With A. O. Rhoad...1345
	Carob, use in flour, patent...1540

<u>Item</u>	<u>Item</u>
Carpenter, R. W., harvesting soybeans.....350	Cartter, J. L. - Continued
Carr, R. H.: Meat scraps versus soybean proteins as a supplement to corn for growing chicks. With A. G. Philips, and D. C. Kennard.....1139	Work of the agronomic and analytical divisions of the U. S. Regional soybean industrial products laboratory. With R. T. Miller.....4a
Carriok, C. W.: Soybeans for poultry.....4a	Casberg, C. H.: Investigation of the suitability of soy bean oil for core oil. With C. E. Schubert.....642
Carroll, W. E.	Casein
Effect of soybeans and soybean oil meal on quality of pork. With Sleeter Bull, F. C. Olson, G. E. Hunt and J. H. Longwell.....1039	from cow's milk, replaced by soybean casein.....1364
Making the best use of soybeans in hog feeding.	pellegra-preventive action 1228
1. Soybean crop has limited use in rations for swine.....4b	properties, uses and preparation.....613
2. Objections for fattening swine do not apply to soybean oil meal.....4b	vegetable, properties and uses.....582
Objections to beans for fattening swine do not apply to soybean oilmeal.....904	See also Soybean casein
Soybean crop has limited use in rations for swine.....904	Cass County, Ind.....327
Soybean test compares hogging-down vs. dry lot. With R. A. Smith, Sleeter Bull and J. H. Longwell...1042	Castagnol, E. M.: Étude sur la fabrication du lait de soja.....1190
Carroll County, Ind.....327	Cates, J. S.
Carroll County, Mo.....1072	More soys.....32
Carter, C. E.	New stunts in harvesting soys.....349
Corn plus soys equals pigs...1043	Rising tide of soy beans.....33
Hogs, corn and soybeans.....1044	Soy beans go domestic.....1191
Cartter, J. L.	Victory for the soys.....757
Determination of the oil content of soybeans. With R. S. McKinney and G. S. Jamieson.....436	Cattle
Improvement in soybeans. With W. J. Morse.....167	beef
Some commercial uses of the soybean.....4a	fed
	corn supplemented with soybeans.....872
	soybean and corn ensilage.....145
	soybean oilcake, compared with other feeds.....885
	soybean oilmeal.....917
	soybeans.....4b, 905, 917, 1023-1024
	feeding trials, Louisiana agricultural experiment station.....1017



<u>Item</u>	<u>Item</u>
Cattle - Continued	Cattle - Continued
blood structure, research.....1008	dairy - continued
dairy	fed - continued
fed	soybean hay.....970,972,
alfalfa hay	976,978,1002,1009,
and soybean hay cut at	1019,1032
different stages	compared with
of maturity, effect	alfalfa hay.....988
on vitamin A	compared with
activity of butter982	alfalfa, lespedeza
compared with soybean	and laredo
hay.....988	hays.....1000
with cowpea hay and	cut at different
soybean silage as	stages of maturity,
substitutes for	effect on milk and
purchased feeds...992	fat produc-
coconut meal, gluten feed,	tion...980,983,1029
peanut meal and soy-	effect on flavor and
bean meal as protein	composition
supplements.....997	of milk and
corn silage and soybean	butter.....1001
hay as roughage.....978	increased body
corn supplemented with	weight and de-
soybeans.....872	creased daily
cottonseed meal.....963	milk and butter-
compared with ground	fat produc-
soybeans.....991	tion.....986
extracted feed.....990	machine dried, com-
extracted soybean meal	pared with field-
and wood sugar yeast,	cured hay.....1016
effect on quantity and	soybean meal and soybean
fat content of milk 1005	oil, effect upon
ground soybeans....962,979,	milk and butter fat
1001,1002,1025	composition.....994
compared with cotton-	soybean cilcake
seed meal.....991	Danish experiments 999
compared with cotton-	effect on butter..1006
seed meal and	effect on cow and
soybean meal.....1000	on milk
linseed oilmeal.....979	produced.....996
peanut hay.....970,972	effect on milk pro-
and soybean hay, com-	duction and butter
parative values	quality.....1022
for milk produc-	soybean oilmeal.....977,
tion.....971	1003,1011,1025,1034
silage and cracked soy-	versus soybeans....993
beans.....1031	

<u>Item</u>	<u>Item</u>
Cattle - Continued	Chang, H. C.: Effect of soybean
dairy - continued	feeding on the blood lipase
fed - continued	of rabbits. With A. A.
soybean silage.....976,1033	Horvath.....1247
and corn silage.....145	Chang, Ke-Chung.
soybeans.....4a,4b,284,886,	Soluble soybean milk powder
887,905,917,919,922,	and its adaptation to
977,998,1003,1009,	infant feeding. With
1015,1028,1030	Ernest Tso.....1192
and soybean	Vegetable casein from soy-
products:.....4c	bean and peanut. With
compared with standard	Yung-Sheng Chao.....573
protein feeds....1004	Chao, Yung-Sheng: Vegetable case-
effect upon vitamin	in from soybean and peanut.
A value of	With Ke-Chung Chang.....573
butter.....1027	Charnley, W.: Manufacture of
improved milk pro-	beverages (patent).....1446
duction.....389	Chase, Herbert: Soya bean
versus soybean oil-	plastics.....574
meal.....993	Chasteen, Roy: Outlet of soy-
feeding method, practical	bean products.....4a
and profitable.....987	Chemical foundation, inc., New
fed	York.....48-49,617
extracted feed.....990	Chemical novelties corp.,
soybean oilmeal.....929,963	Cincinnati, Ohio.....1477
poisoning from feeding	Chemical society of Japan on
soybean oilmeal.....1018,	the nutritive value of the
1020,1021	proteins of soy bean and
See also Calves; Soybeans,	pea nut.....1361
uses, farm, as feed	Chen, C. Y.: Nutritive value of
Cauthen, E. F.	soya-bean press-cake. With
Growing soy beans in	T. Liu.....911
Alabama.....34	Chen, Chao-Yu: Comparison of
Soy beans in Alabama.....34	the nutritive value of beef,
Central freight association,	egg white and dried soybean
hearing on soy bean rates	curd with reference to
and privileges.....179	vitamin B.....1193
Chaletzka, E. G.: Verfahren zur	Chen, Fu Hua., stabilization
herstellung von sojabohnenmilch.	of earth roads.....647
With W. S. Ssadikow and M. A.	Ch'en, Shen-Chao
Franzusowa.....1373	Bone building potency of soy
Chambliss, C. E.: Soy-bean ro-	bean diets. With W. H.
tation increases rice yields	Adolph.....1194
greatly.....758	Utilization of calcium in
Champaign County, Ill.....26,83,237,	soy bean diets. With
278,379,723,776,836	W. H. Adolph.....1169
Chandler, S. C.: Progress in	Chen, Tung-Tou: Nitrogen, calcium
control of coddling moth in	and phosphorus metabolism in in-
1934. With W. P. Flint, E. R.	ants fed on soybean "milk."
McGovran and M. D. Farrar.....662	With Ernest Tso and Martin
	Yee.....1387



<u>Item</u>	<u>Item</u>
Chestnut ash, used in preparation of potash lye.....621	Chinese chemical society.
Chevalier, J.: Pains de soja et de gluten pour diabétiques...1195	Vegetable casein from soybean and peanut.....573
Chiao-Tung University. Research institute, Bureau of chemistry, [Preparation of emulsion paints from soybean casein]...614	Chinese Eastern railway, Economic bureau. Soy beans on the world market.....413
Chicago. Board of trade futures market for soybeans.....408	Chiu, Y. T.: Analyses of Chinese foods.
investigation to study desirability of establishing futures market for soybeans.....396	II. Determination of pentosans in soybeans and soybean milk.....1196
may establish futures market for soybeans.....415	Feeding experiment with soybean milk. With A. C. Siddall.....1362
soybean futures market established.....393	Simple method for the determination of oil in soybeans or soybean milk....420
Chicago. Board of trade, Sampling department, inspectors licensed by federal government to sample soybeans.....330	Suggested improvements in the manufacture of soybean milk.....1197
Chicago. University.....1348	Christ, Heinrich: Stoffwechselversuche an wiederkäuern....875
Chicago world's fair. Soybean exhibit.....522	Christian, C. F.: Newton follows the in-and-out method.....397
Chickens <u>See</u> Poultry	Chu, Fu-T'ang
China.....263, 476, 523, 593, 622, 629, 681, 725, 911, 1165-1167, 1193, 1194, 1247, 1256, 1279, 1334, 1342-1343, 1362, 1365, 1382, 1384, 1386-1389, 1400, 1402-1403	Nitrogen metabolism in infants on graded intake of soybean "milk" protein. With Ernest Tso.....1388
China. Inspectorate general of customs, Statistical department.....211	Nitrogen metabolism in infants on graded intake of soybean "milk" proteins. With Ernest Tso.....1389
China. Ministry of industry, commerce and labor, Bureau of industrial & chemical information	Church, M. (quoted).....1171
Soybean as human food....1256	Church, M. B.: Soy and related fermentations.....1198
Soybean oil of China and its manifold uses.....523	Churchill, F. G.: Soy bean, an annual legume.....760
China oil beans <u>See</u> Soybeans	Clarifying agent for wine, vinegar, etc., manufacture, patent.....1553
China wood oil.....692	Clark, C. W.: Food, feed and cotton.....761
Chinch bugs, controlled by soybeans and other crops..753, 826	Clark, S. E.: Soybeans in Canada. With G. P. McRostie, R. I. Hamilton and F. Dimmock....142
Macoupin County, Ill.....759	Clark County, South Dakota, soybean day.....109

<u>Item</u>	<u>Item</u>
Class, C. F.: Soy beans as a farm crop.....762	Clover hay - Continued
Clemmons, J. G.: Soy bean marketing.....398	production costs.....307
Clemson Agricultural college of South Carolina. Influence of ground soybeans on market milk production.....962	red
Clemson Agricultural college of South Carolina, Extension division. Soy beans....15,35,514	.. compared with soybean hay.....198,299
Clover.....808	value for fattening lambs, compared with soybean hay and ground soybean hay.....1150
advantages of crop, fewer than soybeans.....307	Cluff.....730
as soil improver compared with soybeans.....126	Clyburn, T. M.: Green soybeans, alfalfa, and permanent pastures as forages for fattening hogs. With E. G. Godbey and E. D. Kyzer.....1054
crop failure, soybeans as substitute.....66,171,187, 235,803,848,880,913	Cobb, C. W.: Soy-bean enthusiast.....763
fed to hogs, with corn and soybeans.....1098	Cochel, W. A.: Supplements to corn for fattening hogs in dry lot. With J. H. Skinner.....1104
harvesting with combine, corn belt.....376	Coconut cake, compared with soybean oilcake in feeding experiments.....885
in rotation with corn.....830	Coconut meal as protein supplement in dairy ration, compared with linseed meal.....997
with corn, soybeans and wheat.....64	Coconut oil, imports.....25
Champaign county, Ill.....836	Coconut products, demand, diminished by home-production of oil-producing crops.....82
Indiana.....63	Coddling moth, control, use of soybean oil combined with lead arsenate and lime.....662
production cheaper than soybean production.....307	Coffee substitute, from soybeans
where before impossible, through soil improvement with soybeans.....780	See Soybeans, uses, food, as coffee substitute
See also Soybeans, uses, farm, in rotation	Cohn, Martin
red, hay and pasture legume...894	Procédé de fabrication d'une farine de soya de goût modifié. (patent).....1447
supplemented with soybeans....951	Process for producing a soya flour with changed flavor and the product thereof (patent).....1447
sweet green manure and pasture, best uses.....894	Cole, L. J.: Selection for quality of oil in soy beans. With E. W. Lindstrom and C. M. Woodworth.....643
lands too acid for, grow soybeans.....303	
Clover hay	
fed to heifers, inferior to alfalfa hay when fed liberally with corn.....975	



<u>Item</u>	<u>Item</u>
Coleman, D. A.	Cone, C. N. - Continued
Brown-Duvel moisture tester and how to operate it. With E. G. Boerner.....421	Cellulose-fiber product treated with a size embodying soy-bean flour and process of making the same. With Glenn Davidson, H. F. Rippey, I. F. Laucks, and H. P. Banks (patent).....1456
Efficiency of electric moisture testers.....422	Plastic composition and method of making same. With I. F. Laucks, H. P. Banks, Glenn Davidson, and H. F. Rippey (patent).....1504
Handbook of instructions for the installation and opera- tion of the Tag-Heppenstall moisture meter. With H. C. Fellows.....423	Process of making a water- resistant adhesive and the product thereof. With Glenn Davidson and Irving Laucks (patent).....1449
Revised methods for operating the Brown-Duvel moisture tester. With H. C. Fellows.....421	Process of manufacture of glue and the product thereof. With I. F. Laucks (patent).....1505
Simple method for determining the oil content of seeds and other oil-bearing materials. With H. C. Fellows.....424	Process of preparing soya bean protein containing material for the manu- facture of an adhesive, and the product thereof. With L. W. Eilertsen, Glenn Davidson, I. F. Laucks, and H. P. Banks (patent).....1466
College of agriculture and mechanic arts of University of Porto Rico, Mayaguez. Cooking qualities of soy- beans.....1199	Protein product and process of making. With E. D. Brown (patent).....1450
Collin, Eug.: La graine, la poudre et le tourteau de soja.....1200	Connecticut.....22,36,399,525, 786,821,931,1327
Colorado. Agricultural experiment station. Soybeans under ir- rigation in Colorado.....204	Connecticut. Agricultural ex- periment station.....1327
Colter, C. E.: Soybeans win favor on farm.....764	Soy beans.....786
Columbia broadcasting system.....591	Tests of soy beans, 1914.....56
Combine, used in harvesting soybeans See Soybeans, harvest- ing, machinery, combine	Tests of soy beans, 1915.....36
Common, L. E.: Manufacture of soya bean oil. With Hull oil manfg. co., ltd. (patent).....1448	Tests of soy beans in 1916.....525
Conant, L. C.: Soy bean oil.....644	
Concepcion, Isabelo: Greater significance of soy bean in the Filipino dietary.....1201	
Cone, C. N.	
Adhesive from soybean flour. With Glenn Davidson, I. F. Laucks and H. P. Banks (patent).....1455	

Item

Connecticut (Storrs) Agricultural  
experiment station.  
    Corn and soybeans as a  
        combination crop for  
    silage.....931  
    Soy bean as a forage and  
        seed crop.....821  
    Soy beans in Connecticut....22  
Connecticut. Dept. of agriculture,  
Bureau of markets. Connecticut  
seed law rules and regulations  
with suggestions for the re-  
tailer, wholesaler and  
farmer.....399  
Contant, P. J.: Transparent,  
flexible, non-inflammable  
plastic from soy beans,  
capable of replacing celluloid,  
suitable for finishing, spinning  
and weaving. With J. B. F.  
Perrot. (patent).....1451  
Cook, A. S.: Soy bean meal vs.  
cotton seed meal.....963  
Cook, I. S.: Soy beans - an  
important West Virginia crop.  
With W. B. Kemp.....37  
Coombes, A. I.: Soybean oil  
prevents one type of chick  
paralysis. With C. A. Elvehjem,  
P. H. Phillips, and E. B.  
Hart.....1128  
Copper contained in soybean  
products.....1166  
Copra  
    extraction apparatus and  
    process, patent.....1585  
    uses.....733  
Corman, R. H.: Soybean.....575  
Corn  
    acreage, reduction problem,  
    soybeans as a solution....199,  
                                    754  
    adaptation to same conditions  
    as soybeans, Kansas.....303  
    aided by soybeans.....802  
    amino acid deficiency, for  
    growth in white rat.....1311

Item

Corn - Continued  
    and cowpeas, hogged down,  
    gains compared with corn  
    and soybeans, Louisiana..314  
    and tankage, prices, make  
    cost of producing pork  
    high.....1057  
    competition with soybeans,  
    labor needs.....915  
fed  
    dairy cattle  
        cracked, with cracked  
        soybeans, corn  
        silage, alfalfa hay,  
        and ground oats....998  
    with alfalfa hay.....975  
hogs  
    compared with corn and  
    soybeans,  
    Missouri.....770  
    deficiency.....1103  
    supplemented by Spanish  
    peanuts, soybeans  
    and skim milk.....1052  
    with fishmeal.....1054  
    with linseed oilmeal  
    and soybean oilmeal  
    compared....1079,1087,  
                    1096,1104,1110  
    with rape and soy-  
    beans.....1105-1106  
    with soybeans and  
    clover.....1098  
    with soybeans and soy-  
    bean oilmeal.....1090  
    with soybeans, compared  
    with corn alone,  
    Missouri.....770  
    with soybeans, middlings  
    and tankage compar-  
    ed.....1103  
    with Spanish peanuts,  
    soybeans and  
    skim milk,  
    Georgia.....1052  
    with tankage.....1056  
    with tankage, soybean  
    oilmeal and soybeans  
    compared.....1087



<u>Item</u>	
Corn - Continued	
fed - continued	
hogs - continued	
with yeast and	
casein.....	1100
horses, with soybeans and	
oats.....	1122-1123
lambs	
shelled, supplemented	
with soybean products	
or linseed oil-	
meal.....	1155-1156
with corn stover, soybean	
oilmeal, linseed oil-	
meal or corn gluten	
meal.....	1159
with soybeans or oats..	1160
with timothy hay,	
soybean oilmeal, and	
linseed oilmeal or	
corn gluten meal....	1159
sheep, with soybeans.....	1154
feeding, economical	
methods.....	1103
for grain, sections adapted	
to soybean growing,	
Michigan.....	532
gluten meal, nutritive	
value.....	1159, 1162
growing conditions, compared	
with soybean growing	
conditions.....	874
grown alone, compared with	
corn drilled with soybeans	
and soybeans alone, Ohio	
State University farm.....	818
grown with soybeans...68,235,253,	
744,745,777,796,806,823,	
852,887,931,943	
advantages.....	765,785
compared with corn alone	
and soybeans alone, Ohio	
state university farm...818	
competition, effect on	
soybean yield.....	939
effect of date and rate of	
planting on.....	939

<u>Item</u>	
Corn - Continued	
grown with soybeans - continued	
effect upon dry matter	
percentage of the	
two crops.....	947
good only in theory.....	765
hogged down.....126,797,802,	
1042-1043,1082,1086,1095	
Carroll County, Mo....	1072
costs.....	1038
Fayette County,	
Indiana.....	1081
give cheapest gains	
when compared with	
other crops,	
Louisiana.....	314
Kentucky.....	313
pork producing	
value.....	1119
Iowa.....	783
labor costs.....	320
lessened losses through	
chinch bugs	
Macoupin County,	
Ill.....	759
Missouri.....	770
Missouri.....	770
no injury to the corn....	771
power costs.....	320
profitable.....	746,772
use of tractors and	
tractor equipment on	
alluvial lands,	
Louisiana.....	320
value in pork produc-	
tion.....	1035
Wildwood farms, Richmond,	
Va.....	782
yield	
average expected per	
acre, Corn Belt....	253
of forage for sheep	
or cattle,	
Missouri.....	770
under irrigated condi-	
tions, Fort Collins,	
Colo.....	204
Wooster, Ohio.....	253

<u>Item</u>	
Corn - Continued	
grown with soybeans and	
sunflowers.....	910
harvesting methods, dependence	
upon hog market outlook.....	83
hogged down	
and hogs given run of	
self-feeder of tankage,	
costs and profits.....	313
costs and profits,	
Kentucky.....	313
gains compared with corn	
and soybeans, Louisiana	314
supplemented with soybeans	
compared with rape.....	1106
in rotation	
with clover.....	830
with cowpeas.....	830
with soybeans.....	830
with soybeans or cowpeas	
and teff.....	843
with soybeans, wheat	
and clover.....	64
Champaign County,	
Ill.....	836
Indiana.....	63
with wheat.....	830
meal	
and soybean oilmeal more	
efficient than corn meal	
and linseed meal in	
fattening hogs.....	1104
dry and digestible matter	
in hog feeding.....	1070
with soybean oilmeal,	
economy of milk pro-	
duction.....	963
Mississippi Delta.....	4
Missouri.....	111
nitrogen consumption replaced	
by soybeans.....	831
oil.....	733
prices, depressed by financial	
weakness.....	410
production	
costs, labor and power,	
Louisiana.....	319

<u>Item</u>	
Corn - Continued	
production - continued	
effect of soybeans on,	
central and southern	
Louisiana.....	748
with mechanical power....	319,
	320
Louisiana.....	319
proteins	
supplemented by tomato	
seed, peanut and soy-	
bean proteins.....	1272
value in chicken	
growth.....	1139
replaced by soybeans.....	66
Corn Belt.....	143,834
Piatt County, Illinois....	14
silage.....	126,171,187,817,
908-909,920,931,1026,1033	
and grain.....	745
and soybean hay vs. soy-	
bean hay alone in	
dairy ration.....	978
calory content.....	967
compared with soybeans...	745
economical production	
needed.....	946
Lafayette County, Wis....	909
more satisfactory than	
corn alone...946,949,1033	
net energy value See	
Corn, silage, calory	
content	
Ohio Agricultural Experi-	
ment Station.....	939
or hogging down.....	789
profitable.....	949
recommended to dairymen,	
New York State.....	1026
with cracked soybeans and	
alfalfa hay, cracked	
corn and ground oats,	
for dairy cattle.....	998
with ground soybeans gives	
balanced ration.....	915
with pole beans or	
soybeans .....	948
Wooster, Ohio.....	253



<u>Item</u>	<u>Item</u>
Corn - Continued	Cotton - Continued
supplement to cowpeas.....1059	preparatory crop for tobacco,
supplement to soybeans .....1059	...experiments.....775
supplemented with soybeans,	production; profitable,
corn belt.....143	...impossible because of
surplus, replacement by	boll weevil, soybean
soybeans.....276	planting urged.....1258
utilization; economical,	Cotton Belt.....214,535,761
methods.....1103	Cottonseed
vitamin content exceeded by	analysis, methods must be
soybeans.....916	...changed for analysis of
with soybeans adjoining,	soybeans.....646
profitable.....772	export market, affected by
yields	introduction of soybean
affected by planting in	into Europe.....219
combination with soy-	extraction, apparatus and
beans.....83,819,1086	process, patent.....1585
following oats, compared	manufacturers, meeting soy-
with yields following	bean competition in
sudan grass and soy-	European market.....264
beans, Iowa.....851	meal
following sudan grass and	bagged, prices, specified
soybeans, compared with	markets.....81
yields following oats,	compared with soybean
Iowa.....851	grain.....822
of grain, compared with	compared with soybean
soybeans and cowpeas.....34	hay and bran.....960
Corn Belt.....83,143,164,199,217,	fed
251,283,288,323,386,788,808,	dairy cattle.....963
816,830,836,850,874,878,923,	compared with ground
932,1082,1105,1116	soybeans.....1000
Corn borer invasion, causing	vs. wheat bran
increased interest in soy-	and dried
beans, Illinois.....86	brewers'
Corsicana, Texas.....162	grains.....992
soybean conference.....47,102	to fatten cattle,
Costa, Domenico: Sulla panificazione	substituted with
con le farine di estrazione	ground soybeans...991
di soia.....1202	feed value.....
Costa, Mario.....448	analyses compared with
Cotton	ground soybeans....991
cake, decorticated, feeding	compared with soybean
value, compared with	oilmeal.....963
soybean oilcake.....891	prices, specified
lands; invaded by soybeans....210	markets.....466
oil mills, possibility of	replaceable by soy-
being used for soybeans....213	beans.....848

<u>Item</u>	<u>Item</u>
Cottonseed - Continued	Cowpea hay - Continued
meal - continued	yields
source of protein	compared with soybeans...299
compared with soybean	Kentucky.....124
hay and bran.....960	Cowpeas.....52,68,87,89,93,258,473
in milk production.....984	adaptation
source of vitamin G.....1299	Nebraska.....120
yield less than soybean	Oklahoma.....161
yield.....298	soil and climate, compared
oil	with soybeans.....844
prices	advantages over soybeans....832
compared with soybean	certainty of good stand..755
and corn oil.....733	and corn, hogged down, gains
specified localities....81,	compared with corn and
466	soybeans, Louisiana.....314
production.....81	as fodder crop.....843
yield, equal to soybeans...298	as green manure crop,
outlook charts.....466	possibly better than
products.....541	soybeans.....832
extent of competition	carbohydrate content.....954
of American with Far	compared with soybeans....68,79,
Eastern soybeans in	156,392,565,755-756,844,937
European market.....264	composition.....120
oil content, determina-	chemical.....161
tion, Wesson optical	feed value.....120
method.....424	for hogs.....1077
soybeans as substitute.....303	compared with soybeans,
Cottrell, H. M.	Cedara, Union of
New drought-resisting crop -	South Africa.....1112
soy beans. With D. H.	forage, compared with soy-
Otis and J. G. Haney.....38	bean forage.....815
Soy beans in Kansas in 1900.	grown for hay and seed pro-
With D. H. Otis and J. G.	duction, compared with
Haney.....39	soybeans.....90
Coultas, W. H.: Soybean oilmeal..876	grown for seed, northern
Coville, F. V.: Soybean	Indiana and southern
cheese.....1203	Michigan.....768
(cited).....1400	grown with soybeans.....887
Cowpea hay.....120	grown with sudan grass for
compared with soybean hay.....68	silage, compared with
food content, compared with	cowpeas and sudan grass
soybean hay.....299	alone.....954
in dairy ration	handled by wholesale and retail-
substitute for purchased	seedsmen.....473
feeds.....992	harvesting.....120,281,847
with soybean hay and vetch	machinery.....161
hay, substitute for	methods.....154,161
wheat bran.....964	hay See Cowpea hay



<u>Item</u>	
Cowpeas - Continued	
history.....	154,281,847
hold place which soybeans cannot take, Tennessee.....	156
Illinois.....	44
importance of crop	
Kentucky.....	124
Oklahoma.....	161
in rotation.....	120,847
compared with soybeans.....	792
Oklahoma.....	161
with corn.....	830
with corn and teff.....	843
Kentucky.....	124
Missouri.....	111,154
movements.....	473
prices.....	473
by state or district.....	469
production.....	256,281,472
costs.....	281
first step in well-balanced farm system, sandy-land areas of northern Indiana and Southern Michigan.....	768
opens up new sources of plant food in the soil.....	843
provides better feed.....	843
protein content.....	954
recommended	
as labor saver and for soil improvement.....	743
instead of soybeans, Winnebago County, Ill....	937
replaced by soybeans, south Louisiana.....	314
returns, compared with soy- beans, south Mississippi....	71
seed	
harvesting, Kentucky.....	124
market notes.....	473
outlook.....	473
prices.....	473
by states.....	474
shipments.....	473
by states.....	474
stocks, by states.....	474
storage, Kentucky .....	124

<u>Item</u>	
Cowpeas - Continued	
shipments.....	473
by state or district.....	469
from producing centers by local shippers.....	473
silage.....	120
Southern States.....	873
stocks and supplies.....	473
by State or district.....	469
storage.....	120
threshing.....	120,281,847
Kentucky.....	124
methods.....	154
uses.....	154,281,847
farm.....	154,281,847
as soil improver..	120,843
compared with soy- beans.....	157,166,844
for seed production, compared with soy- beans.....	815
Missouri.....	154
Nebraska.....	120
varieties.....	473
California.....	232
Kentucky.....	124
yield	
compared with corn and soybeans.....	34
compared with grain crops, Nebraska Agricultural experiment station....	120
compared with soybeans and field beans.....	784
states other than Nebraska.....	120
varieties tested at Nebraska Agricultural experiment station....	120
Cowsert, W. C.: Soybeans for dairy cows. With J. S. Moore.....	1000
Cox, C. H.	
Report of soy bean analysis committee.....	645
Soy bean analysis.....	425,646
Cox, H. R.: Soybeans for New Jersey.....	40

<u>Item</u>	<u>Item</u>
Crandell, J. S.: Possibilities of the stabilization of earth roads with soy bean oil.....647	Cruz, A. O.: Composition of Philippine soy beans and soy-bean oil. With A. P. West.....508
Crane, H. R.: Story of the soya.....41	Csonka, F. A.: Soybeans content of amino acids varies greatly with variety. With D. B. Jones.....430
Craven County, North Carolina....309	Cuba.....534, 597, 887
Craver, A. E.: Adhesive water- proofings and sizing compo- sition (patent).....1452	Cuba. Estación experimental agronómica, Utilización de la soya. Santiago de las Vegas, Habana.....534
Crawford, C. W. Soybean hay and sweet-clover pasture for growing pure- bred draft fillies. With J. L. Edmonds.....1124	Cudahy packing co., Omaha.....1172
Soybeans for horses and mules. With J. L. Edmonds.....904, 1123	Culbertson, C. C.....995, 1083, 1151
Cream marketing value lowered through undesirable flavor caused by soybeans.....1001	Effect of ingesting soybeans and oils differing widely in their iodine numbers upon the firmness of beef fat. With B. H. Thomas and Fred Beard.....1023
sour, from cow's milk, digestibility, compared with soybean sour cream, soybean "quarg", and soy- bean protein.....1053	Effect of soybeans upon the firmness of beef fat. With B. H. Thomas.....1024
substitute, manufacturing process, patent.....1600	Getting the most out of the soy bean hay and grain...877
<u>See also</u> Soybean cream	Influence of soybeans upon the gains, feed require- ments, and character of the fat produced when fed to growing and fattening spring pigs on rape pasture. With B. H. Thomas, F. J. Beard, and W. E. Hammond.....1045
Crin, R. F.: Soybeans for Minnesota. rev. With A. C. Army and R. E. Hodgson.....5	Soybean and alfalfa hays for wintering pregnant ewes. With W. E. Hammond and J. M. Evvard.....1153
Cromer, C. O. Soy beans and cowpeas. With A. T. Wiancko and M. L. Fisher.....154, 847	Soybean hay for fattening lambs. With J. M. Evvard, W. E. Hammond, and K. K. Henness.....1150
Soybeans in Indiana. With A. T. Wiancko.....282	Cullison, W. V.: Soy bean and commerce.....43
(cited).....848	
Cromwell, R. O.: Importance of the soybean.....42	
Cronshaw: Soya products.....1178b	
Crumbaker, J. M.: Twenty years with soybeans. Conclusions derived from experience on Meharry Farms. With C. L. Meharry, W. E. Riegel, L. J. Withrow, E. N. Stafford.....4a	



<u>Item</u>	<u>Item</u>
Cuthbert, H. R.: Manufacture of flour, bread, and similar food-stuffs from leguminous seeds. With O. C. Hexamer (patent).....1489	Davidson, Glenn - Continued Cellulose-fiber product treated with a size embodying soy-bean flour and process of making the same. With H. F. Rippey, C. N. Cone, I. F. Laucks, and H. P. Banks (patent).....1456
Cutler, G. H.: Improvement for soybean bar cylinder thresher 351	Glue and method of making. With I. F. Laucks (patent).....1503
Czadek, Otto: Verfahren, sojabohnen oder sojabohnenmehl zum menschlichen genuss geeignet zu machen (patent).....1453	Plastic composition and method of making same. With I. F. Laucks, H. P. Banks, H. F. Rippey, and C. N. Cone (patent).....1504
Czechoslovakia.....241	Process of making a water-resistant adhesive and the product thereof. With C. N. Cone and Irving Laucks (patent)..1449
D., R.: Die verseifbarkeit des soja-phosphatids.....648	Process of making a water resistant double decomposition adhesive and to the product thereof. With I. F. Laucks (patent).....1457
Dacy, G. H. Cheap foods from soy beans...1204 New products from soy beans...649	Process of making a water resistant vegetable protein containing adhesive and to the product thereof. With I. F. Laucks (patent).....1458
Dalbey, D. S. Cowpea and soy bean in Illinois.....44 Pork production in Illinois..1046	Process of preparing soya bean protein containing material for the manufacture of an adhesive, and the product thereof. With L. T. Eilertsen, C. N. Cone, I. F. Laucks, and H. P. Banks (patent) .....1466
Dalrymple, W. H.: "Hogging down crops." With A. F. Kidder.....314	Process of preparing substances composed in part of protein-containing cells for the manufacture of adhesives (patent)...1459
Dammer, E.: [Process for preparing an agent for decolorising and clarifying tannin and dyestuff extracts from soya beans] (patent).....1454	
Daniels, A. L.: Nutritive value of the soy bean. With N. B. Nichols.....1205	
Darden, W. B.: Allied mills soy-bean plant dedicated.....45	
Datz, Albert: Process for the production of stable mixtures with or without soya oil. With Metallgesellschaft. (patent).....1530	
Davidsohn, J.: Die bleichung der oele mit bleicherden.....650	
Davidson, Glenn Adhesive from soybean flour. With C. N. Cone, I. F. Laucks, and H. P. Banks (patent).....1455	
Adhesive from soy-bean flour, etc. With I. F. Laucks (patent).....1502	

<u>Item</u>	<u>Item</u>
Davidson, Glenn - Continued	
Process of reducing the water requirement of compositions of matter embodying vegetable protein containing material and to the product thereof. With E. D. Brown and I. F. Laucks (patent).....1442	Dearborn conference of agriculture, industry and science, Dearborn, Mich. Proceedings 1935..... 48
Vegetable adhesive and method of making. With I. F. Laucks (patent).....1506	1936..... 49
Vegetable glue and method of making same. With I. F. Laucks (patent).....1507-1508	1937.....50
Davidson, H. R.: Soy beans make soft pork.....1047	Dearborn conference of agriculture, industry and science, 3d, Dearborn, Mich., 1937. Soy bean committee, reports..50
Davidson, W. M.: Digestibility of Canadian feeding stuffs - soybean oil meal. With C. J. Watson, J. C. Woodward, G. W. Muir, and C. H. Robinson.....944	Deatrick, E. P.: Reduction of soil nitrates during the growth of soybeans.....766
Davies, Sir J. T.....504	Delaware.....79,724,945,1025,1064,1110-1111,1146-1148
Davis, G. D.	Delaware. Agricultural experiment station
Soy bean is profitable Texas crop.....46	experiments on effect of ground soybeans on cold storage quality of eggs.....1146
Soy bean meet held at Corsicana.....47	Ground soybeans as a protein supplement for growing chicks.....1147
Davis, R. S.	Ground soybeans as a supplement for laying birds.....1148
Legume crop for cornbelt farms.....878	soybean and wheat hog feeding tests.....1111
Soybeans increase farm efficiency.....1048	Soybean meal and ground soybeans as protein supplements for dairy cattle.....1025
Davis, W. J.: Soybeans in South Georgia.....4	Soy bean oil.....724
Davis, Watson, radio interview with H. G. Knight on U. S. Regional soybean industrial products laboratory.....591	Soy beans.....79
Dawson, C. R.: Soy beans for silage. With R. B. Becker, W. M. Neal, and P. T. D. Arnold.....864	Soybeans as a protein supplement to corn for fattening pigs on forage.....1110
Deal, T. M.: As we farm in Iowa.....765	Study of soy bean hay....945
	study on soybean.....557
	Swine production in Delaware.....1064
	Delmas, F.: Alimentation des volailles avec la farine de soja.....1129



<u>Item</u>	<u>Item</u>
Delwiche, E. J.	Dickey, J. B. R. - Continued
Soybeans - a crop worth	Soybeans in Pennsylvania.....53
growing. With R. A.	Diense, F. van.: Sur les
Moore.....158	avantages de la peptone
Soybeans - a good legume	pepsique de tourteau de
crop borrowed from the	soya pour la préparation
Orient. With R. A.	des milieux de culture.
Moore and G. M. Briggs.....159	With Albert Berthelot and
Soy beans - an important	G. Amoureux.....571
Wisconsin crop. With	Dies, E. J.: Soy, the midwest's
R. A. Moore.....160	miracle bean.....54
Denbo, L. H.: Soy bean (vegetable)	Dietz, R.: Die bedeutung des
milk in infant feeding. With	sojamehls als backhilfsmittel
F. R. Rittinger.....1347	bei weizenmehlen.....1207
Deming, G. W.: Soybeans under	Dike, T. W.
irrigation in Colorado. With	Art of gluing (patent).....1461
D. W. Robertson and Alvin	Gluing materials together
Kezer.....204	(patent).....1460
Deming, M. F.	Gluing process (patent)....1461
address at meeting of National	Dimmock, F.
soybean growers' associa-	Soybeans. With L. E.
tion.....1256	Kirk.....55
Soybeans for human food.....4	Soybeans in Canada. With
Demolon, A.: Lait végétal?.....1206	G. P. McRostie, R. I.
Deobald, H. J.....868,952	Hamilton and S. E.
Descartes de G. Paula, Ruben.	Clark.....142
A soja como materia prima	Dionfeld, L.: Ueber die
para industria.....51	verwendung des Berczeller'schen
Devlin, L. P.: Biochemical	sojamehle im kriege.....1178a
studies of soybean milk and	Ditmar, Rudolf: Die bedeutung
chicken protein. With J. S.	des sojabohnenöls als
Hepburn and K. S. Sohn.....1236	dehnungserhöher und als
Diabetics	plastikator für die herstellung
treatment with soybean diet..1177,	von kaltvulkanisaten.....651
1296-1297,1340,1354,1401	Dittes, F. L.: Soy bean as
home-made soybean meal....1348	human food.....1208
recommended.....1230	Dobruhinina, T. K.....1357
soluble protein extract	Soybean milk. With V. M.
from soybeans.....1401	Voskresenskiï.....1298
soybean bread...1176,1346,1358	Using spent press cake from
soybean flour.....1178	soybean milk in the
soybean meal and milk for	chocolate industry.....1298
processes of making,	Dodd, D. R.: Some factors af-
Austrian chemists.....1336	fecting the influence of
value of gluten bread for....1195	soybeans, oats, and other
Dickey, J. B. R.	crops on the succeeding
Soybeans, cowpeas and	crop. With G. G. Pohlman...767
Canadian field peas.....52	

Item

Dodd, Robert: Preparation of semiplastic material from the soya bean. With H. B. P. Humphries (patent).....1462

Dodson, W. R.: Soybeans are valuable for silage when grown with other feed crops.....879

Do fu. See Soybean cheese

Domaschintzky, J.: Synthetic milk [from soya beans] (patent).....1463

Donath, W. F.: De voedingswaarde der sojaboon en enkele daaruit bereide specifiek Indische voedingsmiddelen.....61

Dorr, Carl: Soybean mills will stimulate market.....56

Dorsey, Henry: Growing soybeans.....57

Dounine, M. S. See Dunin, M. S.

Downs, Charles: Method or process of extracting oil from vegetable seeds, nuts, and the like. With R. A. Bellwood and T. W. Turnill (patent).....1464

Dox, A. W.: Experiments with soy bean meal as a substitute in the army ration.....1209

Drake, J. A.: Management of sandy-land farms in northern Indiana and southern Michigan.....768

Drescher, I.: [Comparative nutritive values of soybean meal and meat and bone meal of Polish origin in the starting ration of chicks.] With M. S. Gutowska.....1130

Ducceschi, Virgilio  
La farina di soja nella alimentazione umana.....1210

Osservazioni relative alla nota del Dott. Ronolo Venturi sulla utilizzazione della soja per l'alimentazione umana.....1211

Item

Ducceschi, Virgilio - Continued  
La soja e l'alimentazione nazionale.....58

Duck, R. W.: Growing soy beans in the East.....59

Dugard, Jean: La valeur alimentaire et industrielle du soja.....60

Duggar, J. F.: Vetch, cowpea, and soy bean hay substitutes for wheat bran.....954

Duley, F. L.: Soil erosion of soybean land.....769

Dunfield [soybean association]..4a

Dungan, G. H.: Soybean hay studies. With C. A. Van Doren.....4b

Dunham, H. V.: Glue and process of making same (patent)....1465

Dunin, M. S.  
Chemical (granular) method of drying soybean seeds..485

Claytonisation of soybean seeds. With A. M. Symski and F. M. Shemiakin.....485

drying and storing of soybean seed, with G. A. Val'dman.....177

Heat and moisture régime for the storage of soybean seeds. With E. A. Tolskaya.....485

Results of practical work and actual problems of drying and storing soybean-seeds. With N. S. Thormann.....485

Dunn, Russell.....1151

Dunton, H. L.: Curing soy bean hay. With C. R. Megee.....353

DuRant, A. L.  
Protein supplements to corn in dry lot for fattening pigs. With E. G. Godbey.....1055

Soybean forage for hogs. With E. G. Godbey.....1057

"Durener" cattle sickness.....989, 1008



<u>Item</u>	<u>Item</u>
Durig, A.: Soy as a foodstuff...1216	Ebonite, prepared with soybean lecithin compares favorably with that from ordinary rubber.....601
Durkee, M. M.	Eczeṃa, treatment with soybean diet.....1177
Soybean oil in the food industry.....1212	Eddy, C. O.: Soybean oil meal emulsifies mineral oils.....657
Uses of soy oil.....493	Eddie, E. S.: Cultivation and uses of soya beans.....509
Utilization of soya beans....1212	Edison institute, Dearborn, Mich., research in soybeans.....559
D'yachenko, P.: Plastics from the vegetable casein of the soy bean.....576	Edmonds, J. L.
Earle, F. R.: Occurrence of phosphorus in soybeans. With R. T. Milner.....652	Soybean hay and sweet-clover pasture for growing purebred draft fillies. With C. W. Crawford.....1124
East Indies (Dutch). Departement van. Landbouw, nijverheid en handel. Afdeeling landbouw. Kedelee.....61	Soybeans for horses and mules. With C. W. Crawford.....904,1123
East Texas Chamber of commerce...102	Edmondson, J. B.
Soy bean greatest natural food.....533	If your clover failed, try soybean hay.....880
sponsor of East Texas Soy bean conference, Corsicana.....162,236	Soy beans and permanent agriculture.....63
East Texas Soy bean conference, Corsicana, Texas, plans.....162	Why grow soybeans.....4a
Eastern States.....4,59	Edmonson, J. F.: Certified seed.....4a
Eastman, W. H.	Effront, I. A.: Manufacture of proteolytic enzymes by means of micro-organisms [utilizing soja cakes]. With A. R. Boidin (patent) 1428
Development of the soybean oil meal industry.....654	Eggs
Domestic soybean oil now appreciated.....653	cold storage quality, effect of ground soybeans fed to hens on.....1146
Exporters taking soy beans away from U. S. mills.....62	utilization, food product, patent.....1521
Industrial development of the soybean industry.....618	white
Industrial utilization of soybean oil and soybean oil meal.....654	nutritive value, with reference to vitamin B, compared with beef and dried soybean curd.....1193
Soybean oil and meal in industry.....654	
Utilization of soybean oil meal.....655	
Utilization of the soybean in the oil milling industry.....656	

Item	Item
Eggs - Continued	Elting, E. C.
white - continued	Molasses as a preserving
protein, superior to	agent in making soybean
protein of soybean	silage.....882
oilcake in growth of	Molasses as a preserving
young rats.....1377	agent in making soybean
substituted with whipped	silage. With J. P.
soybean oilmeal.....1313	LaMaster.....881
yolk	Soybean oil prevents one
source of lecithin most	type of chick paralysis.
important.....1314	With A. I. Coombes,
substitution possible, by	P. H. Phillips, and
soybean lecithin in	E. B. Hart.....1128
baking.....1235	Elvehjen, C. A.: Relation of
Eilertsen, L. W.: Process of pre-	protein to hemoglobin building.
paring soya bean protein con-	With P. B. Pearson and E. B.
taining material for the	Hart.....1333
manufacture of an adhesive,	Emulsions, manufacture,
and the product thereof.	improvements, patent..1578-1579
With C. N. Cone, Glenn	Encephalomalacia See Nutritional
Davidson, I. F. Laucks, and	encephalomalacia
H. P. Banks (patent).....1466	Encyclopédie Biologique, v. I,
Eisenschiml, Otto	III, VII, XVII.....16
Domestic soya bean oil.....658	Engelmann, F. W.: Process for
Domestic soya bean oil, its	the production of stable
history and prospects.....658	water-containing emulsions
History and prospects of	of vegetable lecithin from
domestic soya bean oil.....658	soya beans. With M. J.
Soy beans in industry.....659	Brinckmann, Arnold Mergell,
Elizabeth City [N. C.] oil and	August Brinckmann, and
fertilizer co.....563	Fritz Mergell (patent).....1467
Ellett, W. B.: Comparative value	England.....885
of peanut meal, cottonseed meal	Enver, Ismail: Beitrag zur
and soybean meal as sources	kenntnis der einwirkung
of protein for milk production.	verschiedenfach entfetteter
With C. W. Holdaway and W. G.	sojaschrote auf das blutbild
Harris.....984	bei haustieren.....883
Ellis, N. R.: Effects of light,	Enzymes
soybean and other diet supple-	domestic application,
ments on seasonal hatchability	Eastern countries.....1223
and egg production. With	in soy sauce brewing.....1330
T. C. Byerly, H. W. Titus,	Epple, W. F.: Early, inter-
and R. B. Nestler.....1127	mediate and late cut soybean
Ellison, R. W.: Determining the	hay for milk and butterfat
color of soya bean oil.....660	production. With J. H.
Elsdon, G. D.: Chemistry and	Hilton and J. W. Wilbur.....980
examination of edible oils and	
fats, their substitutes and	
adulterants.....1214	



<u>Item</u>	<u>Item</u>
Epstein, A. K.: Process of providing a new food product and improved product produced thereby (patent).....1468	Evvard, J. M. - Continued
Ergosterol in soybean oil.....1267	Soybeans for flour.....1215
Erslev, Knud	Soybeans in stock rations.....884
Process and adaptation for adapting oil cakes and the like for human food (patent).....1469	Soybean's popularity ascending.....67
Process for the manufacture of artificial milk [from soya bean] (patent).....1470	Experiment stations, State, cooperating with U. S. Regional soybean industrial products laboratory.....591
Escot, Emm. Pozzi- See Pozzi-Escot, Emm.	Fain, J. R.
Espe, D. L.	Crops for the silo. With A. M. Scule.....933
Gastric digestion of soybean flour. With L. N. Shoptaw and C. Y. Cannon.....1012	Soybeans and cowpeas. With P. O. Vanatter.....68
Production of dairy cows when fed only silage and cracked soybeans. With N. K. Williams and C. Y. Cannon.....1031	Fairchild, L. H.
Etheridge, W. C.	Soy bean oilmeal and ground soy beans as protein supplements in dairy rations. With J. W. Wilbur.....965
Corn and soybeans. With C. A. Helm.....770	Soybean oilmeal and ground soybeans as protein supplements in the dairy ration. With J. W. Wilbur.....966
Productive methods for soybeans in Missouri. With C. A. Helm.....64	Falkenburg & co., Seattle, Wash., soybean oil refining plant.....731
Europe...17,125,130,194,219,264,501	Far East.....17,135,144,211,246,263,264,295,506,725,1124,1232,1258
Evans, A. T.: Soybeans in South Dakota. With Matthew Fowlds.....65	Fargo, J. M.
Evvard, J. M.	Soybean oil meal and other plant protein rations for pigs, supplemented with limestone and bone meal. With G. Bohstedt and W. A. King.....1037
Soybean and alfalfa hays for wintering pregnant ewes. With W. E. Hammond and C. C. Culbertson.....1153	Soybean oil meals prepared at different temperatures as feed for pigs. With J. W. Hayward and G. Bohstedt.....1065
Soybean hay for fattening lambs. With C. C. Culbertson, W. E. Hammond, and K. K. Henness.....1150	Farm chemurgic council, Dearborn, Mich.....48-49,600
Soybean hay for the breeding ewes.....1151	

	Item
Farm chemurgic council, Dearborn, Mich: - Continued	
and soybeans.....	4d
Condensed proceedings...	
1936.....	617
Plan coordinating agri- culture, industry and science.....	577
work in studying soy- beans.....	568
Farrar, M. D.: Progress in control of codling moth in 1934. With W. P. Flint, S. C. Chandler, and E. R. McGovran.....	662
Farver, W. E.	
Cost of soy-bean hay.....	307
More soy-bean hints.....	70
Soybean hay and feeding costs.....	308
Soy beans for seed.....	354
Soy beans no harm to corn.....	771
Fats and oils.....	501
edible, nutrient value.....	1335
<u>See also</u> Corn, oil; Soybean oil; etc.	
Faure, Blattman & Co. Review of the oil and fat markets; 1923-1936.....	450
Fayette County, Ind.....	1081
Feeds and feedstuffs	
digestibility, Canadian.....	944
high-protein, production.....	81
mill, used in dairying, prices lowered by soy- beans.....	873
prices, important markets.....	462
protein standard, value in feeding, compared with soybeans, Tennessee Agri- cultural experiment station.....	1004
relative value as cattle foods.....	1015
<u>See also</u> names of kinds of feeds and feedstuffs	
Fellers, C. R.: Soy-bean oil: Factors which influence its production and composition....	661

	Item
Fellows, H. C.	
Handbook of instructions for the installation and operation of the Tag- Heppenstall moisture meter. With D. A. Coleman.....	423
Revised methods for operating the Brown- Davel moisture tester. With D. A. Coleman.....	421
Simple method for determin- ing the oil content of seeds and other oil- bearing materials. With D. A. Coleman.....	424
Ferrée, C. J.	
Properties of processed soya.....	1217
Soya bean and the new soya flour.....	1218
Ferrin, E. F.	
Expeller processed soybean oil meal compared with other protein supple- ments.....	1049
Soybean and its relation to soft pork. With Don Johnson.....	1050
Soybeans as a part of the protein supplement for growing pigs.....	1051
Ferris, E. B.: Soy beans for south Mississippi.....	71
Fiehe, J.: Uber sojabohnen und sojabohnenbrot.....	1219
Field, A. M.: Soy-bean paste as an emulsifying agent. With B. H. Alexander and E. B. Sylvanus.....	1220
File, Howard: We can make almost anything from soy beans.....	510
Finch, F. R.: Experience with soybeans.....	772
Finks, A. J.	
Making a nutritionally balanced bread. With C. O. Johns and D. B. Jones.....	1268



<u>Item</u>	<u>Item</u>
Finks, A. J. - Continued	Flax - Continued
Nutritive value of mixtures of proteins from corn and various concentrates. With D. B. Jones and C. O. Johns.....1272	seed grades and standards, Kansas.....404 inspection rules, Kansas.....404 oil tests.....444 weighing rules, Kansas...404
Nutritive value of peanut and soy bean flours as supplements to wheat flour. With C. O. Johns and M. S. Paul.....1269	Flint, P. N.: Spanish peanuts, soy beans and skim milk as feeds supplementary to corn.....1052
Studies in nutrition. With C. O. Johns.....1270	Flint, W. P. Fight the chinch-bug with crops. With W. L. Burlison.....753
Finley, J. T.: Soybean compound for ageing grain distillate. (patent).....1471	Progress in control of coddling moth in 1934. With S. C. Chandler, E. R. McGovran, and M. D. Farrar.....662
Fish meal added to hog feed, nutritive value equalled by soybean oilcake.....1108 and corn, feeding.....1054 nutritive value equalled by soybean oilcake with certain supplements..1144-1145 protein supplement to corn for fattening pigs...1055,1069 substituted with soybean oilmeal in poultry feeding.....1137	Soybean insects.....4b Florida. Agricultural experiment station. Soy beans for silage.....864
Fish oil fire hazard same as linseed oil.....676 use, justification, paint and varnish industries.....689	Flour <u>See</u> Soybean flour Flumberfelt, W. E. <u>See</u> Flumerfelt, W. E. Flumerfelt, W. E. Apparatus for continuous solvent extraction and method thereof. (patent).....1472
Fisher, M. L. Soy beans and cowpeas. With A. T. Wiancko and C. O. Cromer...154 Soybeans and cowpeas. With A. T. Wiancko and C. O. Cromer.....847 Soy beans, cowpeas, and other forage crops. With A. T. Wiancko.....281	Soybeans, a link between agriculture and in- dustry.....73
Flanagan, Mike, experience in growing corn and soybeans in silage.....909	Foard, W. E.: Cost of production on Missouri farms. With O. R. Johnson.....312
Flax outlook charts.....466 plantings smaller.....401	Foods breakfast, use of soybean flour (Soyolk) in.....1372 fatty.....501 habits, Chinese, meaning for United States.....1165 health drinks, use of soybean flour (Soyolk) in.....1372 manufactured patent.....1578

<u>Item</u>	<u>Item</u>
Foods - Continued	Fouts brothers, farm management
manufactured - continued	system built around soy-
uses of soybean flour	beans.....816
(Soyolk) in.....1371	Fowlds, Matthew: Soybeans in
needs, American compared with	South Dakota. With A. T.
Oriental.....1165	Evans.....65
production, increased, demand,	Fowls <u>See</u> Poultry
meeting by planting of	Fox, reply to questions on
soybeans, urged, Ohio.....1331	soybean casein glue.....580
products, non-fermented,	Fox, Kirk: Don't overlook the
made from soybeans,	soybeans.....773
patent.....1513	France....555,1175,1408,1416,1426,
Forbes, E. B.: Net-energy values	1428,1435,1443,1447,1451,1479,
of corn silage, soy-bean	1480,1482,1514,1516,1576,1581,
hay, alfalfa hay, and oats.	1586,1588,1594,1609,1613
With W. W. Branan and Max	Frankfurter, P.
Kriss.....967	Die aufgaben der sozialpolitik
Ford, Henry.....623,625	bei der einföhrung des
Ford, W. P.: Soya bean flour.	sojamehles.....1178
Its value to the British	Die verwendung des
confectioner.....1178b	Berczeller'schen sojamehles
Ford motor company, Dearborn,	für die brotbereitung...1178
Mich.....603	Franklin County, Ohio.....178
soybean requirements.....578	Franzusowa, M. A.: Verfahren zur
work done in soybean	herstellung von sojabohnenmilch.
utilization.....48,134,	With W. S. Ssadikow and E. G.
210,574,578-579,583,595,	Chaletzkaya.....1373
603,623	Freehoff, W. A.: Putting protein
Ford motor co., Engineering	into silage.....774
laboratory, Dearborn, Mich.,	Freiburg. Universität.
development of soybean	Hygienisches institut.....1344
plastics.....594	Fremery, F. de: Mededeelingen
Ford motor co., River Rouge	uit de practijk. No. 1.
molding division.....584	Soja en katoen als
Fors, A. J.: El frijol soya,	voorvrucht.....775
materia prima para la	French, R. B.....967
producción de aceite.....511	Freud, Jean
4-H clubs, soybean project,	Advantages of growing soya
Kentucky.....123	bean in Ireland. With
Fouts, F. E.: Soyland. With	D. T. Barry.....1178
Noah Fouts and Taylor	Berczeller's soya flour...1178
Fouts.....4a	La farine de soja.....1178
Fouts, Noah: Soyland. With	Freud, John <u>See</u> Freud, Jean
Taylor Fouts and F. E.	Frey, C. N.: Effect of active
Fouts.....4a	soybean on vitamin A. With
Fouts, Taylor	A. S. Schultz and R. F.
Putting soybeans on hoof.....4	Light.....1221
Soyland. With Noah Fouts	Friedenwald, Julius: Use of the
and F. E. Fouts.....4a	soy bean as a food in diabetes.
	With John Rurah.....1222



<u>Item</u>	<u>Item</u>
Friedman, J.: Soy-bean products and method of preparation. (patent).....1473	Gardner, H. A. - Continued
Friedrichs, W.: Preparation of an extract resembling milk from soya beans and similar seeds. (patent).....1474	Legitimization of soya bean oil.....667-668
Fries, J. A.....967	Papers on paint and varnish and the materials used in their manufacture.....668
Fritzsche, Curt: Deutsche sojabohnen.....512	Physical and chemical examination of paints, varnishes, lacquers and colors.....669
Fryer, P. J.: Technical handbook of oils, fats and waxes. With F. E. Weston.....663	Practical testing of drying and semi-drying paint oils.....670
Fuel oil from soybean fatty acids.....610	Repainting tests on paint oils.....671
Fuller, G. C.: Soybean investigations in the United States. With W. J. Morse.....602	Research in the paint industry.....672
Fuller, J. G.....1070	Soya bean oil in paste colors.....668
Fungus used in soy sauce, industrial applications.....1171	Soya oil in paints.....668
Funk, E. D.: Soy beans as a farm crop.....49	Substitute for linseed oil in paint manufacture.....667
Futures market <u>See</u> Soybeans, markets, futures.	Gasca, Enrico: Il latte vegetale di soia nell'alimentazione e nella terapia delle malattie gastro-enteriche dei bambini. With Alberto Muggia.....1315
G., M.: Soya-bean casein glue....580	Gaskill, E. F.: Soy bean.....75
Galina, A. G.: Verdauung und resorption von gerichten aus sojabohnen im menschlichen organismus. With E. S. London, N. I. Schochor, A. I. Kolotilowa, R. M. Kutok, E. A. Markarjan, and L. W. Popel.....1303	Geerligs, H. C. P.: Uber die anwendung von enzymwirkungen in der Ostasiatischen hausindustrie.....1223
Galich, V. N.....485	Gehrke, August: Method for the production of storable mixtures of lecithin and oil [from fresh soya sludge] (patent).....1475
Galley, H. W.: Industrial use of soybeans.....581	Geimer, V. I., inspection of soybean acreage as a means of obtaining higher yields..177
Gapen, C. E.: Speaking of soybeans.....776	General soya corporation, New York, N. Y.....1483
Gardner, H. A.....632, 701	Génin, G.: La caséine végétale; propriétés et emplois.....582
Changes in oil upon storage...668	Genung, A. B.: Graphic summary of farm crops. With O. E. Baker.....447
Committee work on hexabromide test for determining purity of soya bean oil or linseed oil, Steele or Bailey method.....664	Georgia..4, 68, 197, 252, 279, 346, 1052
Driers for soya oil.....665	
Examination of commercial American soya bean oil.....666	

<u>Item</u>	<u>Item</u>
Georgia. Agricultural experiment station.	Gilchrist, D. A. - Continued
Grille for threshing soy-bean selections.....346	Soya beans and soya cakes.....969
Soy beans and cowpeas.....68	Gill, A. H.: Hydrogenation of soybean oil. With Y. M. Ma.....1225
Spanish peanuts, soy beans and skim milk as feeds supplementary to corn..1052	Gill, L. O.: Treatment of soy beans. (patent).....1476
Georgia. State college of agriculture, Extension service.	Ginn, W. W.: Soybean phosphatides (patent).....1477
Results with special crops in the Piedmont section in 1922.....279	Ginsburg, J. M.: Influence of calcium and nitrogen on the protein content of the soybean plant. With J. W. Shive.....426
Soy beans for Georgia.....252	Gironcoli, Ugo de: Contributo clinico alle ricerche sul contenuto di fattore A negli oli vegetali.....1226
Gerlaugh, Paul: Soybean oilmeal in cattle fattening rations...968	Glassman, B.: Verdauungsversuche an milch an sojanährpräparaten. With S. Gologorskaja.....1053
Germany.....201,212,442,512,883,895,926,985,989,1005,1008,1067-1068,1073,1099,1276,1344,1359,1420,1429,1432,1434-1436,1443,1454,1474,1475,1478,1479,1480,1501,1542,1543,1545,1546,1547,1548,1561,1562,1564,1565,1577,1582,1589,1609	Glidden co., Chicago, soybean processing plant.....700
Gerö, Wilhelm: Die bedeutung des Berczeller'schen sojamehles für die nahrungsmittel-industrie.....1178	explosion in.....703
Gersdorff, C. E. F.: Changes that occur in the proteins of soybean meal as a result of storage. With D. B. Jones.....482	Glidden co., Cleveland, Ohio..1450
Giasotto, Enzo: Integriamo la "Battaglia del Grano".....1178a	Glue manufacturing process, patent.....1503,1505
Gibbs, H. D.: Soja-bean curd, an important Oriental food product. With F. Agcaoili...1224	vegetable manufacturing method, patent.....1507-1508
Gieger, M.: Effect of variety, maturity, and soundness on certain soybean seed and oil characteristics. With J. F. O'Kelly.....440	protein-base, patent....1554
Gilchrist, D. A.	<u>See also</u> Soybean adhesives, glue
Palm kernel cake, palm kernel meal, and cocoanut cake, compared with soya cake, for fattening cattle, young store cattle, and fattening sheep, 1915-1916.....885	Gluten feed, protein supplement in dairy ration, compared with linseed meal.....997
	Godbey, E. G.
	Green soybeans, alfalfa, and permanent pastures as forages for fattening hogs. With E. D. Kyzer and T. M. Clyburn.....1054
	Protein supplements to corn in dry lot for fattening pigs. With A. L. DuRant.....1055



<u>Item</u>	<u>Item</u>
Godbey, E. G. - Continued	Goldberger, Joseph - Continued
Rations for fattening hogs	Study of the pellagra-
on soybean forage.....1056	preventive action of
Soybean forage for hogs.	dried beans, casein,
With A. L. DuRant.....1057	dried milk, and brewers'
Godby, R. W.: Why he grows	yeast. With W. F.
soybeans.....886	Tanner.....1228
Gössel, Fritz	Goller, Hubert
Improvements in or relating	Process for disembittering
to the treatment of soya	and improving soya beans
beans and similar leguminous	or like legumes. With
seeds (patent).....1479	E. C. Winkler (patent)..1609
Manufacture of artificial	Verfahren zur konservierung
milk [from soya beans].	und geschmacksveredelung
(patent)..... 1478	von sojabohnen oder
Procédé de traitement des	früchten von anderen
graines du soja et autres	leguminosen. With E. C.
graines semblables, en vue	Winkler (patent).....1609
de les rendre propres à	Gologorskaja, S.: Verdauungsver-
l'alimentation (patent)...1479	suche an milch an sojanähr-
Process for converting soya	präparaten. With B.
beans and the like seeds	Glassmann.....1053
into a condition suitable	González, A. de J.: Cultivo y
for nutrition (patent)....1479	utilización de la soya como
Process for preparing a rubber	forraje.....887
substitute from soya-bean	Good, E. S.
oil. With A. Sauer	Experiment comparing velvet
(patent).....1480	bean meal, tankage and
Process of manufacturing	soy bean meal as supplements
alimentary products from	to corn meal in feeding
soy-beans (patent).....1481	hogs. With L. B.
Process of manufacturing an	Mann.....1058
alimentary product resembling	Hogging down soy beans
milk from soy beans or	and cowpeas. With M. J.
similar vegetable seeds.	Smith.....1059
(patent).....1482	Goodell, C. J.: Corn and soy
Treating soya beans (patent) 1483	beans for pork production.
Werkwijze voor het veredelen	With E. Barnett.....1035
van sojaboonen en dergelijke	Gouin, M. R. (cited).....60
peulvruchten (patent).....1479	Gouin, R.
Goldberger, Joseph	Le soja et son tourteau....513
Study of the blacktongue	Le soja, fourrage vert.....888
preventive action of 16	Graber, L. F.
foodstuffs. With G. A.	Corn and soy bean partner-
Wheeler, R. D. Lillie,	ship.....777
and L. M. Rogers.....1227	Soy beans, a self fertilized
	seed crop on sandy soils..76

Item	
Graham, R.	
Artificial milk. With	
László Berczeller.	
(patent).....	1418
Bread-making [with soy bean	
flour]. (patent).....	1484
Improving soya beans. With	
László Berczeller	
(patent).....	1420
Grain	
added to soybean oilcake,	
effect.....	934
elevators	
soybean contracts with	
milling companies.....	412
urged to handle soybeans...	403
grades and standards	
charge for grading, federal,	
compared with charge	
for soybeans.....	333
Kansas.....	404
imports, reduction,	
stimulated studies for	
the use of soybean flour	
in breadmaking, Italy.....	1202
in rations of laying pullets,	
unsatisfactory.....	1140
inspection and weighing rules,	
Kansas.....	404
moisture content, determined by	
electric moisture tester...	422
offals,utilization for feeding	
purposes.....	892
small	
harvesting with combines,	
corn belt.....	376
planted after soybeans.....	4
yield	
compared with soybeans.....	119
compared with soybeans and cow-	
peas, Nebraska Agricultural	
experiment station.....	120
See also names of kinds of grain	
Grain and feed dealers national	
association, Soybean com-	
mittee.....	333
Grain and feed dealers national	
association, soybean con-	
ference.....	223

Item	
Granato, L.: A soja.....	77
Grandvoimet, L.: Le soja,	
With Li-Yu-Ying.....	135
Grantham, A. E.	
Experiment with soy beans...	889
Soy bean - its promise as	
a farm crop.....	78
Soy beans.....	79
Suggestions for growing	
soy beans.....	890
Gray, D. T.: Soybean pastures	
for hogs.....	1060
Gray, G. D.	
All about the soya bean in	
agriculture, industry	
and commerce.....	80
Soya bean in international	
trade.....	451
Gray, R. B.: Combining soybeans	
in the South.....	355
Great Britain ....	220, 450, 496, 891-
892, 1021, 1178b, 1408, 1411-1412,	
1418-1419, 1421-1422, 1426, 1429-	
1431, 1439, 1443, 1446, 1448, 1462-	
1463, 1467, 1469-1470, 1473, 1479,	
1482, 1484, 1489-1490, 1494, 1496,	
1497, 1509, 1512-1513, 1515-1517,	
1526-1527, 1529, 1530, 1540, 1542,	
1546, 1549, 1553, 1555, 1557, 1559-	
1560, 1576, 1578-1579, 1581, 1585,	
1587, 1590-1592, 1594, 1605, 1609,	
1612-1613	
Gt. Britain. Board of agriculture	
and fisheries:	
Soy bean.....	891
Utilisation of cereal	
offals and certain	
other products for	
feeding purposes.....	892
Green, R. M.: Cost of producing	
some Missouri farm crops.	
With O. R. Johnson.....	311
Greene, R. E. L.: Cost of producing	
farm products in North	
Carolina.....	309
Grimes, J. C.: Soybean hay as a	
supplement to white corn	
and tankage for growing and	
fattening hogs. With W. E.	
Sewell and W. C. Taylor....	1061



<u>Item</u>	<u>Item</u>
Grimme. Sojanehl in der menschlichen ernährung.....1210	Haas, L. W. Method for improving and removing the odor and/or flavor of legumes. With H. O. Renner (patent).....1485
Grimme, Clemens: Die sojabohne und ihre verarbeitung zu nahrungs- und genussmitteln..1229	Method of reducing oil content of soya. With H. O. Renner (patent).....1486
Grinenco, Ivan: Oleaginous products and vegetable oils; production and trade. With Giorgio Capone.....448	Habs, H.: Ausnützungsversuche mit sojaweiß und einem neuen sojaweißpräparat an tier und mensch. With J. Kapfhammer.....1276
Grinnells, C. D. Comparative values of peanut and soybean hay for milk production. With J. L. Moore.....970-971	Hackleman, J. C.....287 Economic value of the soybean to Northern agriculture.....4
Peanut versus soybean hay for dairy cattle. With J. L. Moore.....972	Future of the soybean as a forage crop.....894
Grodzinski, Paul: Pressed artificial resin objects in automobile construction.....583	Growing soybeans in Illinois.....84
Gross, D. L.: Soybeans in Nebraska. With P. H. Stewart.....247	La soja y sus multiples usos.....85
Grove, E. W.: Soybeans in the United States; recent trends and present economic status....81	Soybean production in Illinois. With O. H. Sears and W. L. Burlison.....86
Guadeloupe.....244	Hadert, Hans: Sojabohnenerzeugnisse in der lack- und klebstoff-industrie.....584
Guard, S. R.: Soybeans in a cornbelt rotation.....83	Hall, F. H.: Soybean and cowpea.....87
Guinea pigs, experiments, testing food value of soybean meal on.....858	Hall, W. L.: Some analyses of commercial soybeans.....427
Gulf coast chemurgic conference and Tung oil association of America, Pensacola, Fla., condensed proceedings..7 1936... ..617	Halliday, G. E.....481 Changes in the phosphatide content of crude soybean oil during storage.....481
Guluii, M. F.: Nitrogen metabolism in soybean feeding of horses. With U. I. Listovnichia.....1125	Method for measuring color of soybean oil. With H. R. Kraybill.....673
Gutermann, B. I.: Ueber die zubereitung der sojamilch. With L. M. Horowitz-Wlassowa and I. A. Oberhard.....1243	Halpin, J. G.....952 Soybean oil meal prepared at different temperatures as a feed for poultry. With J. W. Hayward, C. E. Holmes, G. Bohstedt, and E. B. Hart.....1131
Gutierrez Marin, Rafael.....74	
Gutowska, M. S.: [Comparative nutritive values of soybean meal and meat and bone meal of Polish origin in the starting ration of chicks.] With I. Drescher....1130	

Item

Item

Hamilton, R. I.: Soybeans in Canada. With G. P. McRostie, F. Dimmock, and S. E. Clark.....142

Hamilton, R. W.  
Seed frauds in soybean varieties.....4

Soybeans.....514

Hamilton, T. S.: Digestibility and metabolizable energy of soybean products for sheep. With H. H. Mitchell and W. G. Kammlade.....1152

Hammond, W. E.....1083

Influence of soybeans upon the gains, feed requirements, and character of the fat produced when fed to growing and fattening spring pigs on rape pasture. With C. C. Culbertson, B. H. Thomas, and F. J. Beard.....1045

Soybean and alfalfa hays for wintering pregnant ewes. With J. M. Evvard and C. C. Culbertson.....1153

Soybean hay for fattening lambs. With J. M. Evvard, C. C. Culbertson and K. K. Henness.....1150

Hams  
smoked and cured, commercially satisfactory, from hogs fed soybeans.....1115

See also Pork; Meat

Hanauer.. Neues von den medizinaldrogen.....1230

Haney, J. G.  
New drought-resisting crop - soy beans. With H. M. Cottrell and D. H. Otis.....38

Soy beans in Kansas in 1900. With H. M. Cottrell and D. H. Otis.....39

Hanger, W. E.: Uses of soybean seed.....515

Hankins, O. G.  
Pork firmness is modified by feed and other factors.....1062

Pork of good quality grown efficiently on corn-soybean ration. With J. H. Zeller.....1121

Soybeans in hog production....4

Hannson, Nils: Wert der sojakuchen und des sojamehls bei der fütterung von milchkühen.....973

Hansa Mills, Hamburg, Germany, soybean oil extraction method used.....201

Hanseatische Mühlenwerke aktiengesellschaft.....1601

Fremgangsmate til behandling av oljefrø som sojabønner og lign (patent).....1487

Hansen, J.: Sojabohnenkuchen...895

Hansen, L. A.: Soy bean as human food.....1231

Hansson, N.: Sojamjöl och sojakakor.....896

Harada, Taro: Fermentation of soybean meal. With Kotaro Shimo.....710

Hardenburg, E. V.: Soybean as human food.....1232

Harnisch, H. J.: Soy bean attachment (patent).....1488

Harper, Claude: Soybeans for fattening lambs.....4a

Harper, Woods: It's not too late to plant soys.....778

Harris, J. A.: Plastics and solvents including casein from the farm.....539

Harris, W. G.: Comparative value of peanut meal, cottonseed meal and soybean meal as sources of protein for milk production. With C. W. Holdaway and W. B. Ellett...984



<u>Item</u>	<u>Item</u>
Hart, E. B.	Hauge, S. M. - Continued
Relation of protein to hemoglobin building.	Further study of the factor in soybeans affecting vitamin A value of butter.
With P. B. Pearson and C. A. Elvehjem.....1333	With J. W. Wilbur and J. H. Hilton.....974
Soybean oil meal prepared at different temperatures as a feed for poultry.	Further study of the factor in soybeans affecting the vitamin A value of butter. With J. W. Wilbur and J. H. Hilton.....1028
With J. W. Hayward, J. G. Halpin, C. E. Holmes, and G. Bohstedt.....1131	Ground soybeans and linseed oil meal for growing dairy calves. With J. H. Hilton and J. W. Wilbur.....981
Soybean oil prevents one type of chick paralysis.	Soy bean oil meal in rations for laying pullets. With A. G. Philips .....1140
With A. I. Coombes, C. A. Elvehjem, and P. H. Phillips.....1128	Vitamin A activity of butter produced by cows fed alfalfa hay and soybean hay cut at different stages of maturity.
Harvey, T. W.: Pays net return of \$43.17 per acre.....310	With J. H. Hilton and J. W. Wilbur.....982
Haselhoff, Emil: Schweinemastversuche mit sojabohnenmehl.....1063	Hausman, M. J.: Soybean oil....516
Hatano, Tadashi	Hawaii. Agricultural experiment station. Report of the Assistant agronomist. Experiments with leguminous plants.....206
Nutritive value of soy-bean cake for hens. With Kozo Suzuki.....1144	Hay
Soya bean cake as protein supplement of poultry feed. With Kozo Suzuki...1145	feeding value, various kinds compared.....90
Hauge, S. M.	mixtures
Attempt to remove the vitamin A suppressing factor in soybean oil by adsorbents.	compared with soybean hay and wheat bran milk production.....809
With J. W. Wilbur and J. H. Hilton.....674	including soybeans and cowpeas, yields, Kentucky.....124
Comparison between ground soybeans and linseed oil-meal as protein supplements for growing dairy calves.	shortage, relieved by soybeans, southern Wisconsin.....239
With J. H. Hilton and J. W. Wilbur.....979	standards, U. S. of
Effect of soybeans in the rations of dairy cows upon the vitamin A value of butter. With J. W. Wilbur and J. H. Hilton.....1027	ficial.....338,342
Effect of yeast and casein supplements to corn and soybean rations when fed to rats and swine. With C. L. Shrewsbury and C. M. Vestal.....1100	

<u>Item</u>	
Hay - Continued	
winter killed, replaced by soybeans.....	176
See also names of kinds of hay	
Hayden, C. C.	
Alfalfa and soybean hay for growing heifers.....	975
Soybean hay and soybean silage. With A. E. Perkins.....	897, 976
Soybeans and soybean oilmeal for milk production. With A. E. Perkins.....	977
Hayes, H. K.....	36
Hays, F. A.: Swine production in Delaware.....	1064
Hayward, J. W.....	868
Effect of cystine and casein supplements upon the nutritive value of the protein of raw and heated soybeans. With H. Steen- bock and G. Bohstedt.....	1233
Effect of heat as used in the extraction of soy bean oil upon the nutritive value of the protein of soy bean oil meal. With H. Steenbock, and G. Bohstedt.....	1234
Nutritive value of soybean oil meal as affected by the method of processing soybeans.....	4d
Nutritive value of soybean oil meal prepared by the dif- ferent methods of oil extraction.....	898
Soybean oil meal.....	899
Soybean oil meal prepared at different temperatures as a feed for poultry. With J. G. Halpin, C. E. Holmes, G. Bohstedt, and E. B. Hart.....	1131
Soybean oil meals prepared at different temperatures as feed for pigs. With G. Bohstedt and J. M. Fargo..	1065
Utilization of soybeans.....	517

<u>Item</u>	
Heaton, E. B.: Making the farm feed the cow.....	88
Heberer, A. J.: Some uses of soybean oil in paints and varnishes.....	675
Heckel, G. B.: Fire hazard of the newer "drying" oils.....	676
Hedgson, E. R.: Ten lessons on soy beans and cow peas.....	89
Heinze, B.: Einiges über die oelbohne, ihren anbau, den volkswirtschaftlichen wert und ihre besondere bedeutung als heil- und gewürzpflanze.....	518
Heitshu, D. C.	
Soybean harvesting methods in Virginia.....	356
tests on harvesting soy- beans.....	350
Heller, Hans: Soybean oil.....	677
Helm, C. A.	
Corn and soybeans. With W. C. Etheridge.....	770
Growing soybeans for hay....	357
Productive methods for soybeans in Missouri. With W. C. Etheridge.....	64
Soybean varieties for seed and for hay.....	779
Helmrich, F. H.: Feeding of soybeans to hogs in definite proportions and their effect upon the quality of pork.....	1066
Helms, W.: [New studies of the feeding value of different soybean extraction residues.] With F. Honcamp, Ph. Malkomesius, O. Meier, and K. Naumann.....	900
Helper, G. Y.: Soy beans have many virtues.....	780
Henderson, H. O.: Soybean vs. alfalfa hay for milk produc- tion. With E. L. Anthony.....	955
Hendrick, H. B.: Illustrated lecture on soy beans. With W. J. Morse.....	166



<u>Item</u>	<u>Item</u>
Hennes, K. K.: Soybean hay for fattening lambs. With J. M. Evvard, C. C. Culbertson, and W. E. Hammond.....1150	Heuser, G. F.: Effect of heat on nutritive value of soybean meal. With H. S. Wilgus, Jr., and L. C. Norris.....1149
Henry, W. A.....917	Hexamer, O. C.: Manufacture of flour, bread and similar foodstuffs from leguminous seeds. With H. R. Guthbert (patent)....1489
Henry Lester institute of medical research, Shanghai, China, Division of physiological science.....1342-1343	Hexane used in soybean oil extraction, easily ignited.....705,712
Hentze, G.: Praktische versuche über einige verwendungsmöglichkeiten von pflanzenlezeithin (phosphatide)1235	Heymann, H.: Process of producing soybean flour. With M. Neufeld (patent).....1490
Hepburn, J. S. Biochemical studies of soybean milk and chicken protein. With K. S. Sohn and L. P. Devlin.....1236	Hidaka, Tei: Vitamin D. IV. With Seiichi Izume and Yoshinori Yoshimaru.....1267
Do fu: an oriental food. With K. S. Sohn.....1237	Higashi, Saburo: Antirachitic properties of "Okara" of soy beans. With Kungo Itami.....1261
Herbst, J.: Die einwirkung der verfütterung von holzzuckerhefe im vergleich zu sojaextraktions-shrot auf menge und fettgehalt der milch von kühlen: With K. Richter.....1005	Higuchi, Shiro: Process of treating boiled beans [including soybeans]. (patent).....1491
Herman, V. R. Soybeans and cowpeas for North Carolina.....90	Hill, L. W.: Soy bean food preparation for feeding infants with milk idiosyncrasy. With H. C. Stuart.....1238
Soybeans for the Piedmont and mountain sections of North Carolina. With R. W. Winters.....299	Hills, J. L.: Concerning alfalfa and soy beans.....520
Herrick, H. T.: Research program of the Bureau of chemistry and soils on industrial utilization of farm products.....4e	Hilton, J. H. Attempt to remove the vitamin A suppressing factor in soybean oil by adsorbents. With S. M. Hauge and J. W. Wilbur.....674
Herring cake, decomposition, two different soils, effect of calcium oxide and calcium carbonate upon.....811	Comparison between ground soybeans and linseed oilmeal as protein supplements for growing dairy calves. With J. W. Wilbur and S. M. Hauge.....979
Herrmann, L. F.: Soy bean hay as a sole roughage for dairy cows. With G. A. Bowling.....978	
Hess-Ives lamp, used in soybean oil refining readings.....730	

Item

Hilton, J. H. - Continued  
 Early, intermediate and late  
 cut soybean hay for milk  
 and butterfat production.  
 With J. W. Wilbur and  
 W. F. Epple.....980  
 Effect of soybeans in the  
 rations of dairy cows  
 upon the vitamin A value  
 of butter. With J. W.  
 Wilbur and S. M.  
 Hauge.....1027  
 Further study of the factor  
 in soybeans affecting  
 vitamin A value of butter.  
 With S. M. Hauge and  
 J. W. Wilbur.....974  
 Further study of the factor  
 in soybeans affecting the  
 vitamin A value of butter.  
 With J. W. Wilbur and  
 S. M. Hauge.....1028  
 Ground soybeans and linseed  
 oil meal for growing dairy  
 calves. With J. W.  
 Wilbur and S. M. Hauge.....981  
 Soybeans and soybean products  
 for dairy cows. With  
 J. W. Wilbur.....4c  
 Soybeans for dairy cattle.....4a  
 Vitamin A activity of butter  
 produced by cows fed alfalfa  
 hay and soybean hay cut at  
 different stages of maturity.  
 With S. M. Hauge and J. W.  
 Wilbur.....982  
 When should we cut soybeans  
 for hay? With J. W.  
 Wilbur.....983  
 Himes, R. L.: Industrial  
 utilization of soy beans.....617  
 Hirose, Masawa: Study on  
 polymerised soja bean oil and  
 its soap. With Tsuneo  
 Shimomura.....678  
 Hobson, L. G.  
 Costs and profits in producing  
 soybeans in Indiana. With  
 E. C. Young.....326

Hobson, L. G. - Continued  
 Costs and profits in produc-  
 ing soybeans in north  
 central Indiana, crop  
 of 1923. With E. C.  
 Young.....327  
 Hodgson, R. E.  
 Grow more soybeans in  
 Minnesota. With A. C.  
 Army.....5  
 Soybeans for Minnesota.  
 With A. C. Army and  
 W. W. Brookins.....5  
 Soybeans for Minnesota. rev.  
 With A. C. Army and  
 R. F. Crin.....5  
 Soybeans; their use and  
 culture in southern  
 Minnesota.....781  
 Hogs  
 age, influence upon quality  
 of pork produced.....1066  
 fed  
 corn alone, not the money-  
 maker they are when fed  
 with corn supplemented  
 with a protein feed..1105  
 cowpeas, with supplementary  
 corn ration.....1059  
 soybean hay  
 effect on quality of  
 pork.....1042  
 supplement to white  
 corn and tankage..1061  
 soybean meal, compared  
 with linseed meal....1104  
 soybean oilcake.....1108  
 soybean oilmeal..4b, 917, 929,  
 1037, 1050, 1063, 1069,  
 1073, 1075, 1080, 1083,  
 1087-1089, 1091-1092,  
 1109  
 compared with peanut  
 feed, tankage and  
 fish meal.....1055  
 different processes  
 supplement to  
 corn.....1084



<u>Item</u>	<u>Item</u>
Hogs - Continued	Hogs - Continued
fed - continued	fed - continued
soybean oilmeal - continued	soybeans - continued
effect on pork	substitute for
quality.....1114	tankage.....1074
compared with soy-	supplement to corn...872,
beans and	1035,1043,1058,
tankage.....1113	1079,1081,1090,
expeller processed com-	1096,1105,1121
pared with other	compared with
protein supplements 1049	middlings and
prepared at different	tankage.....1103
temperatures.....1065	compared with
supplement to corn.....1090	rape.....1106
Wisconsin.....868	compared with Spanish
soybeans.....4a,155,886-887,	peanuts and skim
905,917,919,922,1048,1067,	milk.....1052
1071,1076,1078,1080,1082,	for hogs on
1083,1089,1091,1093,1098,	forage.....1110
1115	Knox County, Mo...1044
and soybean oilmeal.....4c,	results may be as
1039,1101	good as soybean
supplement to corn..1120	oilmeal or tank-
compared with cowpeas..1112	age fed with
cooked.....1085,1092	corn.....1113
effect on pork quality 1042,	supplement to corn
1114	meal versus
cause soft pork....1024,	middlings.....1070
1047,1050,1062,1094,	with and without supple-
1097,1102,1109,1116	mentary ration of
not alarming.....1040	corn, Kentucky....1059
compared with soybean	with mineral supple-
oilmeal and	ments.....1117
tankage.....1113	wheat and soybeans.....1111
gain	yeast and casein supple-
costs.....1045	ments in corn and soy-
margin over feed	bean rations.....1100
cost.....1045	grazed on soybeans.....68,917,
ground, metabolism	1041,1057,1060,1064,1072
trials, compared	and corn.....1038,1086,
with ground yeast and	1095,1119
ground peanut	compared with alfalfa
cake.....1099	and permanent pas-
Minnesota.....1051	tures.....1054
nitrogen metabolism	compared with blue grass,
increased.....1125	winter and spring oats,
raw and cooked.....1068	wheat, barley, rye, rape,
	turnips and cow-
	peas.....1077

<u>Item</u>	<u>Item</u>
Hogs - Continued.	Holder, R. C.: Utilization of
grazed on soybeans - continued	soy bean and corn proteins
various rations com-	as affected by suitable
pared.....1056	mineral supplements. With
weight and value in-	D. C. Kennard and P. S.
crease, Illinois.....1046	White.....1136
length of feeding period,	Holland, E. B.
influence upon quality of	Effect of soy bean meal and
pork produced.....1066	soy bean oil upon the
market outlook, influence	composition of milk and
upon methods of harvesting	butter fat, and upon the
corn and soybeans.....83	consistency or body of
metabolism trials, with	butter. With J. B.
dried yeast, ground soy-	Lindsey and P. H.
beans and ground peanut	Smith.....994
cakes.....1099	Soy beans and soy bean
producers, penalized by	oil.....521
packers for marketing	Holman, R. L.: New variety of
soft hogs.....1024	soybeans.....91
production	Holmes, A. D.
blackland section of	Digestibility of protein
North Carolina.....1069	supplied by soy-bean
costs lowered through	and peanut press-cake
use of soybeans.....1118	flours.....1239
increased per acre, when	Digestibility of some
soybeans are grown with	seed oils.....1240
corn.....742	Digestibility of steam-
use of soybeans in.....4	cooked soy beans and
solution to Corn Belt farmers'	peanuts.....1241
financial troubles.....1105	Holmes, C. E.....952
weight, live, increased 600	Soybean oil meal prepared
pounds on one acre of	at different temperatures
soybeans.....1107	as a feed for poultry.
<u>See also</u> Bacon; Pork	With J. W. Hayward, J. G.
Hokkaido Imperial university,	Halpin, G. Bohstedt, and
Faculty of agriculture.	E. B. Hart.....1131
Studies on the proteins and	Holmes, M. G.: Soybeans: pro-
oil of soy beans.....438	duction, composition and
Hokkaido Imperial university,	feeding value. With J. E.
Institute of agricultural	Metzger and Harlow
chemistry. experiments on	Bierman.....809
soybeans.....811	Honcamp, F.
Holdaway, C. W.: Comparative value	New studies of the feeding
of peanut meal, cottonseed meal	value of different soy-
and soybean meal as sources of	bean extraction residues.]
protein for milk production.	With W. Helms, Ph.
With W. B. Ellett and W. G.	Malkomesius, O. Meier,
Harris.....984	and K. Naumann.....900



<u>Item</u>	<u>Item</u>
Honcamp, F. - Continued	Horvath, A. A. - Continued
Die sojabohne und ihre	Changes in hen's blood
abfallprodukte.....901	produced by a diet of
Ueber den wert der sojakuchen	sprouted soy beans.....1132
als futtermittel.....902	Changes in the blood
Hori, S.: Soy bean cake as a	composition of rabbits
substitute for peptone in	fed on raw soy beans....1246
the preparation of the	Effect of soybean feeding
nutrient media. With U.	on the blood lipase of
Bokura.....585	rabbits. With H. C.
Horn, V.	Chang.....1247
Der einfluss von nicht	Effect of soy sauce on
entfetteten und entfetteten	blood sugar and
sojabohnen auf die	phosphorus. With
milcherzeugung und die	Shin-Hao Liu.....1248
butterbeschaffenheit.	El frijol "soya" como
With E. Muhl.....985	alimento nacional.....1251
Die fütterung nicht entfetteter	Newest methods of refining
sojabohnen an mastschweine.	soya oil preserve its
With J. Weber and K.	food value.....1249
Jungermann.....1067	Some biochemical aspects
Fütterungsversuche mit rohen	of soybean oil.....903
und gekochten sojabohnen	Some recent views about
bei mastschweinen. With	soya flour.....1250
E. Muhl.....1068	Soya flour as a national
Hornemann, Curt: Ueber den	food.....1251
vitamingehalt der sojabohne..1242	Soya flour is miller's
Horowitz-Wlassowa, L. M.	best friend.....1252
Ueber die zubereitung der	Soya flour; its manufacture
sojamilch. With I. A.	and use's.....1253
Oberhard and B. I.	Soya phosphatides.....586
Gutermann.....1243	Soybean.....1254
Ueber die zubereitung des	Soy bean as human
kefirs und des kases aus	food.....1255-1256
der sojamilch. With M. I.	Soybean feeding and blood
Livshitz.....1244	calcium.....1257
Horses	soybean flour as national
fed soybean hay.....1124	food.....618
with corn and oats.....1122	Soybean industry.....587
fed soybeans.....887,905,919	Soy-bean industry in the
appearance improved...889,1123	United States.....522
Horvath, A. A. (quoted).....163	Soybean oil as soap making
Acceptance of soya flour	material.....680
depends on correct	Soybean oil for soap
processing.....1245	making.....493,681
Adhesives from soya	Soybean oil of China and
protein.....679	its manifold uses.....523

<u>Item</u>	<u>Item</u>
Horvath, A. A. - Continued	Hulsey, B. B.....47
Soybean points the way to	Humphrey, G. C.....1032
agricultural recovery.....92	Soy bean silage as a food
Hosterman, W. H.: Harvesting	for dairy cows. With
and curing soy bean hay.....358	F. W. Woll.....1033
Hostetler, E. H.: Soybean oil	Soy beans vs. middlings
meal for fattening pigs.....1069	as a supplement to corn
Houston, D. F.: Cowpeas and soy	meal for fattening
beans.....93	pigs.....1070
Howard County, Ind.....327	Value of soy beans in
Howe, H. E.: Lesson from the	grain rations for lambs.
Orient.....1258	With Frank Kleinheinz....1154
Howell, E. V.: Soy beans and	Humphries, H. B. P.: Preparation
soy bean oil.....524	of semiplastic material
Hubbell, C. D.....36	from the soya bean. With
Tests of soy beans, 1915.	Robert Dodd (patent).....1462
With E. H. Jenkins and	Humphries, W. R.: Harvesting
J. P. Street.....36	small grain, soybeans, and
Tests of soy beans in 1916.	clover in the corn belt
With E. H. Jenkins and	with combines and binders.
J. P. Street.....535	With L. A. Reynoldson and
Huff, S. W.: Soy beans with	J. H. Martin.....376
corn.....782	Hunt, G. E.: Effect of soybeans
Hughel, Herman.....306	and soybean oil meal on
Hughes, H. D.	quality of pork. With
Effect of sudan grass and of	Sleeter Bull, W. E.
soybeans on the yield of	Carroll, F. C. Olson, and
cern. With F. S.	J. H. Longwell.....1039
Wilkins.....851	Hunter, J. E.: Soy meal and
Soybeans. With F. S.	gluten meal for turkeys....1133
Wilkins.....783	Hunziker, O. F.: Test of three
Soybeans for Iowa. With	protein concentrates and
F. S. Wilkins.....784	two leguminous roughages
Soy beans in Iowa. With	in milk production.
F. S. Wilkins.....94	With R. E. Caldwell.....986
Soybeans in Iowa farming.	Hutchinson, E. N.....539
With Albert Mighell and	
F. S. Wilkins.....151	Idaho. Agricultural experiment
Hulbert, H. W.	station... Soybean production
Soy bean meal.....95	in Idaho.....96
Soybean production in Idaho.	Iguchi, Kenzo: Influence of soy
With H. L. Spence.....96	bean cake upon milk production
Hulce.....1032	and the quality of butter.
Hull oil manfg. co., ltd., Hull,	With Eiji Takahashi, Kentaro
Eng. Manufacture of soya	Mitamura, and Kiyoshi
bean oil. With L. E. Common	Shirahama.....1022
(patent).....1448	



<u>Item</u>	<u>Item</u>
Iinuma, Toru.....437	Illinois. Agricultural experiment
On the properties of soya	station - Continued
bean protein. With	Soybean crop for fattening
Minoru Mashino.....588	western lambs.....1155
Iliff, J. W.: Resin; coating	Soybean hay and sweet-
composition. With Paul	clover pasture for
Robinson (patent).....1492	growing purebred
Illinois.....4b, 4e, 14, 25-27,	draft fillies.....1124
44, 54, 69, 72, 84, 86, 163, 205, 207,	Soybean production in
210, 228, 231, 235, 237, 245, 275, 278,	Illinois.....86
322-323, 325, 364, 370, 379, 383, 395,	Soybean test compares
398, 402, 406-407, 410, 412, 417, 419,	hogging-down vs.
443, 456, 486-489, 492, 548, 570, 590-	dry lot.....1042
592, 600, 605, 627, 630, 638, 641-642,	soybean thresher.....370
647, 659, 662, 691, 700, 703-704, 716-	Soybeans and cowpeas in
717, 719, 723, 753, 759, 776, 825, 827,	Illinois.....26
836, 904, 916, 937, 1001, 1007, 1039,	Soybeans for horses and
1042, 1046, 1071, 1098, 1109, 1122-	mules.....1123
1124, 1152, 1155-1156, 1374, 1406,	Soybeans found richer in
1427, 1444-1445, 1485-1486, 1581	certain vitamins than
Illinois. Agricultural experiment	corn.....916
station.....443	Study of soybean
Combines in Illinois.....364	varieties with refer-
Cost of producing field	ence to their use
crops in three areas	as food.....1406
of Illinois, 1913-	Supply and marketing of
1922.....322	soybeans and soybean
Cowpea and soy bean in	products.....245
Illinois.....44	"Toasting" soybean oil
Digestibility and	meal lowers palatabil-
metabolizable energy	ity.....1007
of soybean products	Utilizing the soybean
for sheep.....1152	crop in livestock
Effect of soybeans and	feeding.....904
soybean oil meal on	Illinois. Engineering experiment
quality of pork.....1039	station.
(cited).....1109	Investigation of the suit-
experiments with soybeans	ability of soy bean oil
for fattening lambs....1156	for core oil.....642
Fight the chinch-bug with	Possibilities of the
crops.....753	stabilization of earth
Recent developments in	roads with soy bean
the utilization of soy-	oil.....647
bean oil in paint.....638	Illinois. University.....1122
Soybean costs and production	Illinois. University. College of
practices.....323	agriculture.....25
	Soybean marketing out-
	look.....410

<u>Item</u>	
Illinois. University. College of agriculture, Department of agronomy.....	231, 486
survey on soybean acreage.....	456
Illinois. University. College of agriculture, Extension service.....	506
Illinois Agricultural association.....	419
Illinois Farmers grain dealers association, resolutions that soybean inspection be placed under Grain Standards Act.....	336
Illinois farmers' institute. Pigs + corn + soybeans + clover. = ?.....	1098
Soy bean.....	1071
Soybean production and marketing.....	406
Illinois state horticultural society. Progress in control of codling moth in 1934...	662
Soy beans.....	205
Income, agricultural, suggestion for increasing through cheaper methods of harvesting soybeans.....	349
through growing soybeans.....	32
See also Soybeans, production, profits and returns	
India.....	212
Indiana.....	4, 9-10, 63, 189, 225, 233, 281-282, 310, 326-327, 336, 345, 403, 481, 548, 550, 590, 592, 752, 768, 832, 847-848, 865, 878, 922, 965-966, 980-983, 986, 991, 1020, 1074, 1080-1081, 1103-1104, 1113-1114, 1117, 1121, 1134, 1140, 1437-1440
Indiana. Agricultural experiment station.....	1048, 1080, 1095
Costs and profits in producing soybeans in Indiana.....	326

<u>Item</u>	
Indiana. Agricultural experiment station - Continued	
Early, intermediate and late cut soybean hay for milk and butter-fat production.....	980
Effect of soybeans, soybean oil meal, and tankage on the quality of pork.....	1113
experiments on soybean hog feeding.....	1114
feeding trials with soybean hay for cattle.....	983
Ground soybeans and linseed oil meal for growing dairy calves.....	981
Ground soybeans for fattening cattle.....	991
Nutritive value and mineral deficiencies of soybeans.....	1101
soybean hog feeding tests.....	1074
soybean hog feeding trials.....	1121
Soybean oilmeal and ground soybeans as protein supplements in the dairy ration.....	965-966
Soy bean oil meal in rations for laying pullets.....	1140
Soy beans and cowpeas.....	154, 847
Soybeans as a substitute for fattening spring pigs on legume pasture.....	1118
Soy beans, cowpeas, and other forage crops.....	281
Soybeans in Indiana.....	282, 848



<u>Item</u>	<u>Item</u>
Indiana. Agricultural experiment station - Continued	Institut international d'agriculture, Bureau de la statistique générale
Soy beans, middlings and tankage, as supplemental feeds in pork production.....1103	See International institute of agriculture, Rome.
Supplements to corn for fattening hogs in dry lot.....1104	Bureau of general statistics
Test of three protein concentrates and two leguminous roughages in milk production.....986	Institut international d'agriculture, Service de la statistique générale
Thirty-fifth annual report...for the year ending June 30, 1922...1134	See International institute of agriculture
Indiana. Agricultural experiment station, Department of agricultural chemistry.....592	Institute of economics.
Indiana Grain dealers association, resolutions that soybean inspection be placed under Grain standards act.....336	Investigations in international commercial policies.....478
Industry, cooperation with agriculture.....48,594,623	Institute of industrial research. results of paint exposure tests made with soybean oil....537,670,701
through soybeans.....73	Institute of paint and varnish research. Physical and chemical examination of paints, varnishes, lacquers and colors.....669
Infants, fed soybean diet.....1238, 1292,1315,1342,1347,1351,1354, 1356,1362-1363,1369,1386-1389, 1401	Institute of paint and varnish research, Educational bureau, Scientific section See Paint manufacturers association of the United States, Educational bureau, Scientific section
Ingalls, W. F.: Soy beans.....785	International congress of applied chemistry, 8th on the preparation of "natto".....1316
Ingham, A. G.: Soybean milk vs. milk.....1259	International institute of agriculture.
Ingham, L. W.	International yearbook of agricultural statistics, 1910-1937/38.....452
Ground vs. unground soy bean hay.....987	Le soja dans le monde.....97
Ground versus unground soybean hay for dairy cows. With DeVoe Meade.....987	International institute of agriculture, Bureau of statistics. Oleaginous products and vegetable oils; production and trade.....448
Inoculation See Soybeans, inoculation	
Inouye, Ryojei.....631	
on the making of silk from soybeans.....615	
Insects, control by soybeans.....4b	
Institut für fütterungstechnik der forschungsanstalt Tschechnitz, Kreis Breslau...1005	

Item

International live stock hay  
and grain show, Chicago,  
exhibit of Minnesota  
soybeans.....31

Interstate cottonseed crushers  
association, rules for  
soybean oil.....690

Iowa.....23,56,67,94,99,141,151-152,  
225-226,251,291,480,483,590,640,  
683,749-750,760,765,783-784,845,  
851,867,877,905,914,949-950,961,  
995,998,1012-1013,1023-1024,1031,  
1045,1083,1150,1153,1209

Iowa. Agricultural experiment  
station.....905,1095

    experiments on growing  
    soybeans with corn.....949

    Influence of soybeans upon  
    the gains, feed require-  
    ments, and character of  
    the fat produced when  
    fed to growing and  
    fattening spring pigs  
    on rape pasture.....1045

    Journal paper  
    no. J218.....1023  
    no. J357.....1012  
    no. K140.....1024

    Soybean and alfalfa hays  
    for wintering pregnant  
    ewes.....1153

    Soybean hay for fattening  
    lambs.....1150

    Soybeans.....783

    Soybeans as a home-grown  
    supplement for dairy  
    cows..... 998

    Soybeans for Iowa.....784

    Soy beans in Iowa.....94

    Soybeans in Iowa farming...151

Iowa. Agricultural experiment  
station, Farm crops sub-  
section. Project no. 188.....851

Iowa. State planning board.  
Approach to county planning,  
Appanoose County.....683

Item

Iowa academy of science.  
Experiments with soy bean  
meal as a substitute  
in the army ration.....1209

Iowa State college of agriculture  
and mechanic arts.  
    experiments on feeding  
    silage and cracked  
    soybeans to dairy  
    cows.....1031

    Farm and home week.....1083

    Feeding soybeans.....905

    Gastric digestion of  
    soybean flour when used  
    as a substitute for  
    cows' milk in feeding  
    dairy calves.....1013

    Soy bean, an annual  
    legume.....760

    tests on linseed oil  
    vs. soybeans as feed  
    for cattle.....995

Iowa State college of agriculture  
and mechanic arts, Engineering  
extension service.  
    Processing the soybean.....251

Iowa State college of agriculture  
and mechanic arts, Extension  
service. Soybeans for  
    dairy cows.....961

Ireland.....1178

Ishii, Y.: Paste from soy bean  
refuse. (patent).....1493

Italy.....58,384,507,603,693,  
    1172,1202,1260,1353

Italy. Ministero della guerra.  
    Direzione centrale di  
    sanità militare. Commissione  
    per lo studio della soia.  
    Relazione generale a S.E.  
    il Ministro.....1260

Itami, Kungo: Antirachitic  
properties of "Okara" of  
soy beans. With Saburo  
Higashi.....1261

Itano, Arao: Soy beans as  
human food.....1262



<u>Item</u>	<u>Item</u>
Itié, G.: Le soja, sa culture, son avenir.....100	Jackson, A. D.: Soybeans not adapted to southwestern climate.....102
Ito, Chiyomatsu.....610	Jackson County, Iowa, County farm bureau, soybean variety demonstration.....845
Method of extracting fatty oil from soya bean. With Masanori Sato (patent)....1567	Jacobson, C. O.: Comparison of alfalfa hay and soybean hay with and without mineral and cod liver oil sup- plement.....988
Ito, Taro: Soya bean in Manchuria (cited).....484	Jamaica Agricultural society. Soy beans.....1370
Itskov. Mekhanizatsiia i agrotekhnika soi. With Ageev and Vainman.....101	James, D. L.: Teamwork helps Illinois farmers.....402
Ivanova, N. V.: Food value of soybeans.....1263	Jamieson, G. S. Determination of the oil content of soybeans. With R. S. McKinney and J. L. Carter.....436
Iwasa, Yosaburo: Utilization of the by-products in the prepa- ration of soybean oil by the alcohol-extraction method.....684	Oil content of nine varieties of soybean and the char- acteristics of the ex- tracted oils. With W. F. Baughman and R. S. McKinney.....428
Izume, Seiichi. Effect of addition of the soya-bean oil cake to other grain. With I. Komatsubara.....934	Vegetable fats and oils.....103
Nutritive value of the alcohol-extracted oil cake. With Y. Yoshimaru and I. Komatsubara.....934	Japan.....98, 194, 208, 263, 437-438, 496, 588, 601, 610-612, 615, 621, 631, 678, 684-685, 710, 722, 738, 811, 856, 934, 1108, 1144, 1264- 1265, 1267, 1273-1274, 1277- 1278, 1282, 1284, 1361, 1377- 1381, 1390, 1413, 1493, 1523, 1532, 1544, 1551, 1566-1567, 1604, 1610-1611
Oil-extracting process and digestion coefficient of the protein. With Y. Yoshimaru.....934	Japan Imperial zootechnical experiment station, Chiba, poultry feeding trials with soybean cake and kaoliang.....1143
Soy-bean oil cake as a food and its nutritive value. I-II. With Yoshinori Yoshimaru.....1264	Japan Physical and chemical research society. Fujii prize for making of silk from soybeans.....615
Soy-bean oil cake as a food and its nutritive value. III. With Isao Komatsubara.....1265	
Studies on experimental rickets. II. With Yoshinori Yoshimaru and Isao Komatsubara.....1266	
Vitamin D. IV. With Yoshinori Yoshimaru and Tei Hidaka.....1267	

	<u>Item</u>
Jardine, J. T.: Use of Bankhead-Jones funds to promote a co-ordinated program of research between the states in co-operation with the United States Department of agriculture.....	589
Jardine, W. M.: Year in agriculture.....	104
Jeffords, S. L.: Soy beans. With C. P. Blackwell.....	15
Jeffries, C. D.....	967
Jenkins, E. H.....	36
Soy beans.....	786
Tests of soy beans, 1915. With J. P. Street and C. D. Hubbell.....	36
Tests of soy beans in 1916. With J. P. Street and C. D. Hubbell.....	525
Jenkins, J. M.: Biloxi soybean. With E. S. Landry.....	794
Jennings, H. W. K.: Treatment of soya beans. (patent).....	1494
Jeter, F. H.: Soy beans - a valuable crop.....	105
Jima Pian, Hsueh-Chin See Pian, Jina Hsueh-Chin	
Johns, C. O.: Making a nutritionally balanced bread. With A. J. Finks and D. B. Jones.....	1268
Nutritive value of mixtures of proteins from corn and various concentrates. With D. B. Jones and A. J. Finks.....	1272
Nutritive value of peanut and soy bean flours as supplements to wheat flour. With A. J. Finks and M. S. Paul.....	1269
Studies in nutrition. With A. J. Finks.....	1270
Type of bread (patent).....	1495

	<u>Item</u>
Johnson, Don: Soybean and its relation to soft pork. With E. F. Ferrin.....	1050
Johnson, E. B.: Improvement of nutritive properties of soybeans brought about by heating. With C. L. Shrewsbury.....	493
Johnson, E. F.....	199
Commercial growing of soybeans.....	106
Commercial soybean prices.....	4c
Elevator men easily handle soybeans.....	403
Export demand for soybean products.....	4d
Is the soybean over-exploited?.....	526
Keeping up with soybeans.....	107
Soybean acreage expanding.....	108
Soybean oil mill capacity.....	50
Soy bean products.....	50
Statistics of soybean industry.....	50
Johnson, M.....	952
Johnson, N. T.: Manufacture of bean milk at Changsha.....	1271
Johnson, O. R.: Cost of producing some Missouri farm crops. With R. M. Green.....	311
Cost of production on Missouri farms. With W. E. Foard.....	312
Johnson, Otis: Adhesives and processes of producing same, from soya beans. (patent).....	1496
Improvements in or relating to processes for treating soya beans. (patent).....	1497
Process of treating soya beans (patent).....	1497
Johnson seed farms, Williams County, Ohio, soybean demonstration.....	137



<u>Item</u>	<u>Item</u>
Johnston, Floyd: Soybeans for dairy cows. With C. Y. Cannon.....961	Jungermann, K.: Die fütterung nicht entfetteter sojabohnen an mastschweine. With V. Horn and J. Weber.....1067
Johnston, R. E. Grow soybeans in South Dakota.....110 Soybeans in South Dakota..109-110	Justice, J. L. Cutting and threshing soy beans.....360 Grow soy beans with corn....789 Methods of cutting soy beans.....361 Saving soy bean crop.....362 soybeans as a rich source of protein.....893
Joliffe, C. F.: Experience with soys.....906	Kaboul <u>See</u> Soybeans, uses, food, coffee substitute.
Jolson, L.: Dosage de l'humidité dans les fèves de soja.....429	Kajizuka, Susumu Nutritive value of soybean oil treated with methanol.....1273 Nutritive value of soybean powder treated with methanol.....1274
Jones, D. B. Changes that occur in the proteins of soybean meal as a result of storage. With C. E. F. Gersdorff....482 Making a nutritionally balanced bread. With C. O. Johns and A. J. Finks.....1268 Nutritive value of mixtures of proteins from corn and various concentrates. With A. J. Finks and C. O. Johns.....1272 Soybeans content of amino acids varies greatly with variety. With F. A. Csonka.....430 Soybeans - their food value...527	Kakinoto, Yoshihide: Preparation of reclaimed rubber with soy-bean oil.....685
Jordan, G. F.: Try soy beans for pasture.....787	Kaltenbach, D.: Soya. With J. Legros.....112
Jordan, Sam Corn in Missouri; also soybeans and cowpeas.....111 Onward march of soys.....788 Soy bean a husky ally.....1072 Soy beans from soup to nuts...528	Kaltschewa, D.: Zwei legumenosenmehle.....1275
Juday, C. B.: Development of combine reduces soybean losses.....359	Kammlade, W. G. Digestibility and metabolizable energy of soybean products for sheep. With T. S. Hamilton and H. H. Mitchell.....1152 Soybean crop for fattening western lambs. With A. K. Mackey.....1155 Soybeans for fattening lambs.....1156 Soybeans for sheep.....904
Jugo-Slavia.....1593	Kampen, G. B. van Die Dürerer krankheit.....989 Voedingswaarde van geëxtraheerde veevoederstoffen.....990
Jukes, T. H.: Beneficial effect of non-saponifiable fraction of soy bean oil on chicks fed a simplified diet. With S. H. Babcock, Jr.....1126	

<u>Item</u>	
Kansas.....	38-39, 129, 250, 303-404, 590, 797, 1289
Kansas. Agricultural experiment station.	
New drought-resisting crop - soy beans.....	38
Soybean production in Kansas.....	303
Soy beans in Kansas in 1900.....	39
Study of bean sprouts, as a source of vitamin C.....	1289
Kansas. Agricultural experiment station, Farm department.	
Soy-beans.....	113
Kansas. State Board of agriculture. Soy beans as a cash crop in eastern Kansas.....	129
Kansas. State grain inspection dept. Laws and rules... governing inspection and weighing of grain, soy beans and flax-seed, together with their standards and grades.....	404
Kansas State agricultural college, Extension service.	
Growing soybeans in eastern Kansas.....	250
Soybeans in Kansas.....	797
Kano, T.....	1612
Kao, Hsueh-chung; Hemoglobin-building properties of soy bean products. With W. H. Adolph.....	1166
Kaoliang fed to poultry, digestion coefficient.....	1143
Kapfhammer, J.: Ausnützungsversuche mit sojaeiweiss und einem neuen sojaeiweisspräparat an tier und mensch. With H. Habs.....	1276
Kapp, H. J.: Great demand for soybeans.....	907

<u>Item</u>	
Katayama, T.	
Condensed vegetable milk...	1277
On the preparation of a vegetable cheese from the protein of the soy bean.....	1278
Kaupp, B. F.: Value of soybean meal as a feed for chicks...	1135
Kawakami, Tojiro: Utilization of waste liquors from soy beans. With Torazo Nishimura and Tyui Matsumoto (patent).....	1544
Keghel, Maurice de; Les "stand olie" et autres huiles préparées dans leurs applications aux peintures émail & peintures vernissées.....	686
Keith, B. W.: Soy beans as a soil improver.....	790
Kellner, O.: Fütterungsversuche mit schweinen über die verdaulichkeit getrockneter kartoffeln und des entfetteten sojabohnenmehls. With R. Neumann.....	1073
Kellogg, J. H.: New dietetics	1280
Kellogg, J. L.	
Manufacture of a food product [from soybeans] (patent).....	1498
Method of making acidophilus milk. (patent).....	1499
Kellogg toasted corn flake co., Battle Creek, Mich.....	1498
Kelly & Co., Liverpool, Eng....	268
publication on soybean production and use.....	218
Kelsey, R. T.: Will soys replace tankage?.....	1074
Kemner, H.: [Perilla oil and soybean oil [in the paint industry].].....	687
Kemp, W. B.: Soy beans - an important West Virginia crop. With I. S. Cook.....	37



<u>Item</u>	<u>Item</u>
Kempner, Adolph: Soybean (soja max).....114	Kezer, Alvin: Soybeans under irrigation in Colorado. With D. W. Robertson and G. W. Deming.....204
Kempski, K. E.: Die sojabohne....115	Khaletzkaya, E. G.: Simplified method for roasting soybeans with sugar. With I. A. Oberhard.....1298
Kennard, D. C. Ment scraps versus soybean proteins as a supplement to corn for growing chicks. With A. G. Philips and R. H. Carr.....1139	Khankhoje, Pandurang: El frijol soya.....118
Utilization of soy bean and corn proteins as affected by suitable mineral supplements. With R. C. Holder and P. S. White....1136	Kiang, P. C.: Nutritive value of soy-bean products. With W. H. Adolph.....1168
Vegetable proteins in poultry.....1137	Kidder, A. F.: "Hogging down crops"... With W. H. Dalrymple.....314
Kennedy, C. N.: Getting the facts about soy beans.....116	Kiesselbach, T. A. Soy beans.....119 Soy beans and cowpeas.....120
Kennedy, L. W.: Soybean: A new American.....117	Kiltz, B. F. Oil and protein studies of Oklahoma grown soy beans. With J. E. Webster.....446
Kentucky.....123-124, 313, 657, 792, 1058-1059	Soybeans for Oklahoma.....121
Kentucky. Agricultural experiment station. Experiment comparing velvet bean meal, tankage and soy bean meal as sup- plements to corn meal in feeding hogs.....1058	Kime, P. H.: I. Factors in soybean production; II. Variety recommendations and characteristics. With R. L. Lovvorn and R. E. Stitt.....801
Hogging down experiments...313	Kin, Yamei.....1382
Hogging down soy beans and cowpeas.....1059	Kinako powder, compared with soybean oilcake as sub- stitute for peptone, in nutrient media.....585
Soybeans.....792	King, B. M. Soybean crop in Missouri....122 Soybean hay production.....363
Kentucky. Agricultural experiment station, Department of entomology and botany.....657	King, F. G.: Ground soybeans for fattening cattle.....991
Kentucky. University. College of agriculture, Extension divi- sion. Soybean project, junior 4-H Clubs.....123	King, W. A.: Soybean oil meal and other plant protein rations for pigs, supple- mented with limestone and bone meal. With G. Bohstedt and J. M. Fargo...1037
Kentucky state horticultural society. Soybean oil meal emulsifies mineral oils.....657	
Kenyon, E. T.: Soybeans for soil improvement.....791	

Item

Kingan and co., Indianapolis....1080  
 Kinney, E. J.  
     Soybean project, junior 4-H  
     clubs.....123  
     Soybeans. With George  
     Roberts.....792  
     Soybeans and cowpeas in  
     Kentucky.....124  
 Kinochoshi. Shoyu enkaku-shi  
     [History of soy-sauce manufac-  
     ture].....1281  
 Kinoshita, Asakichi: On the  
     yield of products in the  
     preparation of Japanese  
     soy (shoyu).....1282  
 Kirjassoff, M. D.: Vegetable-oil-  
     bearing materials of  
     Manchuria.....453  
 Kirk, L. E.: Soybeans. With  
     F. Dimmock.....55  
 Kiseleva, E. K.: Preserving  
     soybean-milk residue for use  
     in making crackers. With I. A.  
     Oberhard.....1298  
 Kishlar, Lamar  
     Some nutritive developments  
     in soybean products.....1283  
     Soybean oil in the foundry....4c  
 Kita, G.: Japanische  
     sojaindustrie.....1284  
 Klaas, Helen  
     Food uses for varieties of  
     beans. With Sybil  
     Woodruff.....493  
     Study of soybean varieties  
     with reference to their  
     use as food. With Sybil  
     Woodruff.....1406  
 Klein, J.: Vegetable milk in  
     infant feeding.....1285  
 Kleinheinz, Frank  
     Value of soy beans as a part  
     of a grain ration for lambs.  
     With W. B. Richards.....1160  
     Value of soy beans in grain  
     rations for lambs. With  
     G. C. Humphrey.....1154

Item

Klin See Milk, cow's, powder  
 Kloser, F. J.: Soy beans with  
     corn for silage.....908  
 Knight, H. G.  
     Industrial utilization of  
     farm products.....600  
     New markets for soybeans....590  
     Useful soybean.....591  
 Kodama, Renichi: Nature of the  
     oil of soy bean miso.....1286  
 Kolotilowa, A. I.: Verdauung  
     und resorption von gerichten  
     aus sojabohnen im menschlichen  
     organismus. With E. S.  
     London, N. I. Schochor,  
     A. G. Gagina, R. M. Kutok,  
     E. A. Markarjan, and L. W.  
     Popel.....1303  
 Komatsubara, Isao  
     Effect of addition of the  
     soya-bean oil cake to  
     other grain. With S.  
     Izume.....934  
     Nutritive value of the  
     alcohol-extracted oil  
     cake. With S. Izume  
     and Y. Yoshimaru.....934  
     Soy-bean oil cake as a  
     food and its nutritive  
     value. III. With  
     Seiichi Izume.....1265  
     Studies on experimental  
     rickets. II. With  
     Seiichi Izume and  
     Yoshinori Yoshimaru.....1266  
 Kon, S. K.: Biological values  
     of the proteins of breads  
     baked from rye and wheat  
     flours alone or combined  
     with yeast or soya bean  
     flour. With Zofja  
     Markuze.....1287  
 Korea.....1351  
 Kornfeld, Arnold: Die ölbohne  
     oder soja.....125  
 Koumyss See Soybean koumyss



Item	Item
Koyama, Manshi: On the nutritive value of the proteins of soy bean and pea nut. With Tokitaka Shiba.....1361	Kurahashi, N.: Effect of soya-bean-lecithin on vulcanization of rubber, and the manufacture and uses of powdered rubber prepared by the use of soya-bean-lecithin. With S. Minatoya.....601
Krajčinoić, M.: O prerađivanju sirovog sojinog zrna za ljudsku hranu.....1288	Kurtsina, O.: Nutrient value of edible fats and oils. With A. K. Pickat, N. S. Zenin, and P. I. Alekseeva.....1335
Kramer, A.: Zur einföhrung des Berczeller'schen sojamehles in Italien.....1178a	Kutok, R. M.: Verdauung und resorption von gerichten aus sojabohnen im menschlichen organismus. With E. S. London, N. I. Schochor, A. G. Gagina, A. I. Kolotilowa, E. A. Markarjan, and L. W. Popel.....1303
Kramer, M. M.: Study of bean sprouts as a source of vitamin C.....1289	Kyoto imperial university, Physical and chemical study council, Fujii prize for converting soybean protein into fiber.....631
Kraybill, H. R. Isolation of sucrose from soybeans. With R. L. Smith and E. D. Walter.....592	Kyzer, E. D.: Green soybeans, alfalfa, and permanent pastures as forages for fattening hogs. With E. G. Godbey and T. M. Clyburn.....1054
Method for measuring color of soybean oil. With G. E. Halliday.....673	L., W. H.: Soybean - a crop with a future.....126
Process of converting soy-bean oil, and of obtaining lecithin (patent).....1500	Labbé, Henri: Le soja et ses usages.....1291
Soy bean chemistry.....49	Lacey, James Corn and soybeans for silage.....909
Soy-bean oil. With R. L. Smith.....711	From sandburs to soy beans.....127
Kreglow, G. C., soybeans as a good, though expensive food for hogs.....893	Soy beans to the rescue.....793
Kriss, Max: Net-energy values of corn silage, soy-bean hay, alfalfa hay and oats. With E. B. Forbes and W. W. Braman.....967	Lacquer, manufacture, process, patent.....1568
Krueck, W. B.: Soybeans with oil extracted produce quality pork.....1075	Ladd, Culver: Soya bean investigation.....688
Kühl, Hugo: Fett, lezithin und eiweiss der sojabohne....1290	Lafayette County, Wis.....910
Kummer, H.: Ueber den einfluss der lagerung der sojabohnen auf die extrahierbarkeit und die extraktionsgeschwindigkeit des oclés und der phosphatide. With G. Bredemann.....479	
Kupelwieser, Ernst.....1216	
Haltbares sojamehl.....1178a	

<u>Item</u>	<u>Item</u>
Lagneau, E.: Versuche über den stickstoffansatz von wachsenden schweinen bei fütterung mit trockenhefe, sojaschrot und erdnusskuchen- mehl. With J. Schmidt and Freiin v. Schleinitz.....1099	Landis, H. A.: Soybeans and their culture.....128
Lahey, W. G.: Fish oil and soya bean oil as paint and varnish vehicles.....689	Landon, I. K.: Soy beans as a cash crop in eastern Kansas.....129
LaMaster, J. P.: Molasses as a preserving agent in making soybean silage. With E. C. Elting.....881	Landry, E. S. Biloxi soybean. With J. M. Jenkins.....794
Lambs character of carcass, effect of various rations on.....1150	Rejuvenating prairie rice soils.....795
fed rations supplemented by soybean-oil meal, lin- seed meal, or corn gluten meal.....1159	Lane, C. B. Alfalfa hay, cow pea hay and soy bean silage as sub- stitutes for purchased feeds.....992
soybean oilmeal, as supplemental ration, compared with linseed meal or corn-gluten meal.....1159	Report of the Dairy husbandman.....992
soybeans.....4a	Langenberg, J. W. H.: Die bedeutung der sojabohne in der weltwirtschaft.....130
as supplement to corn..1160	Langworthy, C. F.: Soy beans as food for man.....297
in grain ration.....1154	Lard, imports.....474
various rations, gains on.....1150	Laredo Bean growers' associa- tion, Marshall County, Tenn..91
feed consumption, effect of various rations on.....1150	Lathan, F. P.: Economic value of the soybean to Southern agriculture.....4
feed requirement, effect of various rations on.....1150	Laucks, I. F. Adhesive from soybean flour. With Glenn Davidson, C. N. Cone and H. P. Banks (patent).....1455
market finish and value, effect of various rations upon.....1150	Adhesive from soy-bean flour, etc. With Glenn Davidson (patent).....1502
shrinkage in shipping, effect of various rations on.....1150	Cellulose-fiber products treated with a size embodying soy-bean flour and process of making the same. With Glenn Davidson, H. F. Rippey, C. N. Cone, and H. P. Banks (patent).....1456
water consumption, effect of various rations on.....1150	Commercial oils, vegetable and animal, with special reference to Oriental oils.....690
western, fattening, on soybean products and shelled corn 1155	
<u>See also</u> Sheep	
Lampé, Eduard: Food for diabetics [from soybeans] (patent).....1501	



<u>Item</u>	<u>Item</u>
Laucks, I. F. - Continued	Laucks, I. F. - Continued
Glue and method of making.	Vegetable adhesive and
With Glenn Davidson.	method of making. With
(patent).....1503	Glenn Davidson (patent) 1506
Plastic composition and	Vegetable glue and method
method of making same.	of making same. With
With H. P. Banks, Glenn	Glenn Davidson
Davidson, H. F. Rippey,	(patent).....1507-1508
and C. N. Cone (patent)...1504	Laucks, I. F., inc., Seattle,
Pressed soya bean oil.	Wash.....1455-1456,1459-1461,
With H. P. Banks.....1293	1466,1497,1503,1506-1508
Process of making a water-	Laude, H. H.: Soybeans in
resistant adhesive and	Kansas. With J. W.
the product thereof.	Zahnley.....797
With C. N. Cone and Glenn	Laufer, Stephen: Assimilable
Davidson (patent).....1449	protein decomposition
Process of making a water	products from soybeans, etc.
resistant double decompo-	With Robert Schwarz
sition adhesive and to	(patent).....1580
the product thereof.	Laughland, J.: Soybeans in
With Glenn Davidson	Ontario. With W. J.
(patent).....1457	Squirrell.....242
Process of making a water	Law, Drake, reply to.....1217
resistant vegetable protein	Law, H. D.: Properties of
containing adhesive and to the	processed soya.....1294
product thereof. With	Layson, S. V.: How to grow
Glenn Davidson (patent)...1458	soy beans.....131
Process of manufacture of	Lead, compared with soybean
glue and the product	flour, as sticker for lead
thereof. With C. N.	arsenate in spraying fruit,
Cone (patent).....1505	Indiana.....752
Process of preparing soya	Lead arsenate, combined with
bean protein containing	soybean oil and lime tested
material for the manufacture	for use in coddling moth
of an adhesive, and the	control.....662
product thereof. With	League of nations
L. W. Eilertsen, C. N.	International statistical
Cone, Glenn Davidson,	year-book 1926-1936/37...454
and H. P. Banks (patent)..1466	Publications. II. Economic
Process of reducing the	and financial. 1927. II.
water requirement of compo-	42, 69; 1929. II. 16;
sitions of matter embodying	1930. II. 10; 1931. II.
vegetable protein contain-	A. 16; 1932. II. A. 11;
ing material and to the	1933. II. A. 7; 1934.
product thereof. With	II. A. 6; 1935. II. A. 3;
E. D. Brown and Glenn	1936. II. A.8; 1937.
Davidson (patent).....1442	II. A.7.....454

<u>Item</u>	<u>Item</u>
League of nations - Continued	Lecomte, F. G.: Improvements in the manufacture of food products or beverage from the soya bean (patent).....1509
Statistical year-book <u>See</u>	Le Goff, Jean
League of nations, International statistical year-book	Un aliment précieux pour diabétiques: le soja....1296
Lebedev, A. N.	Le soja dans l'alimentation des diabétiques.....1297
Methoden der feuchtigkeitsbestimmung in sojabohnen.	Legros, J.: Soya. With D. Kaltenbach.....112
With T. V. Pereverzeva.....431	Legumes
Die vergleichenden untersuchungen über die methodik der asche- und phosphorbestimmung in den sojabohnen. With W. Alexandrow.....432	as feeds, supplemented by soybeans.....66
Lebedev, I. A.: Smeshannye posevy na korm kukuruzy soi podsolnechnika.....910	disembittering and improving, process, patent.....1609
Lebedev, N. A.	flavor removal, method, patent.....1485
soybean for hay and forage....177	odor removal, method, patent.....1485
soybean for pasture.....177	phosphatides, purification, process, patent.....1432
Lechartier, G.: Etude sur le soja hispida.....132	treatment, process, patent.....1440, 1518
Lecithin	<u>See also</u> Clover; Cowpeas; Soybeans; etc.
and oil, storable mixtures from, process, patent.....1546	L'Heureux, L.: Le soja.....519
value, in chocolate and cocoa industries.....1314	Lehmann, E. W.: Combines in Illinois. With I. P. Blauser.....364
vegetable, included in stable mixtures, production, process, patent.....1530	Leipzig. Physiologisch-chemisches institut.....1276
<u>See also</u> Soybean lecithin	Leipzig. Universität.
LeClerc, J. A.	Medizinische klinik.....1276
Baking tests and value of soybean flour.....4c	Leipzig. Universität. Veterinär-Physiologisches institut.....1359
Composition and characteristics of soybeans, soybean flour, and soybean bread. With L. H. Bailey and R. G. Capen.....1174	Leith, B. D.: Fluctuating variations in the soy bean.....433
Partial list of processes for removing the bitter taste from soybeans.....1295	Leningrad. Nauchno issledovatel'skii institut pishchevoi promyshlennosti. [Uses of soybeans in confectionery].....1298
Soybeans and soybean flour and the effect of storage conditions upon the composition of soybeans.	Lentil meal, vitamin content, A and B.....857
With L. H. Bailey.....4d	



<u>Item</u>	<u>Item</u>
Leprosy	Li, Yu-Ying - Continued
effect of certain oils not	Sauce consisting chiefly
in chaulmoogra group on...1399	of soja grains
effect of soybean oil	(patent).....1515
ethyl esters on.....1399	Le soja. With L.
Lespedeza hay	Grandvoinnet.....135
in dairy ration, compared	Soya flour and its de-
with soybean hay.....1000	rivatives, and food
reports from shippers.....473	and condimentary products
<u>See also Hay</u>	having a soya bean
Levine, C. O.: Soy beans versus	basis (patent).....1516
oil meal in the ration of	Vegetable milk [from soya
the dairy cow.....993	beans] and its deriva-
Levine, Harold: Vitamin G content	tives (patent).....1517
of some foods. With R. E.	Lieberherr, Ernst: Verfahren zur
Remington.....1299	veredelung von saren, wie
Levinson, A. A.: Food-flavoring	Z. B. sojabohnen, hülsefrüchten,
material containing soybean	etc. (patent).....1518
products. With L. K.	Liebscher, K.: Nutritive value
Pillsbury (patent).....1510	of soybean silage. With
Lewis, A. J.: Soybean oil	W. Liebscher.....1157
varnishes. With K. S.	Liebscher, W.: Nutritive value
Markley.....691	of soybean silage. With
Lewis, R. D.	K. Liebscher.....1157
Soy beans. With C. F.	Lien-en, Tsao: Marketing of
Noll.....455	soya beans and bean oil.....405
Soybeans for Pennsylvania.....133	Light, R. F.: Effect of active
Soybeans: their culture.	soybean on vitamin A.
and uses. With C. F.	With C. N. Frey and A. S.
Noll.....183	Schultz.....1221
Li, Yu-Ying.....1206	Lighty, L. W.: Soy beans in
Method of manufacturing [food]	the corn for silage
products from soja.	(cited).....765
(patent).....1511	Ligori, Maria: Osservazioni
Mill for the wet-grinding of	sul valore alimentare dei
soja grains [soya beans]	semi di soja.....1300
(patent).....1512	Lillie, R. D.: Study of the
Non-fermented and sugared	blacktongue preventive
alimentary products con-	action of 16 foodstuffs.
sisting essentially of	With Joseph Goldberger,
soja grains (soya beans)	G. A. Wheeler, and L. M.
(patent).....1513	Rogers.....1227
Procédés et dispositifs pour	Lima beans, compared with
la transformation intégrale	soybeans.....190
du soya.....560	Lime
Processes and means for the	combined with soybean oil and
complete transformation	lead arsenate, for use in
of soya beans (patent)....1514	coddling moth control....662

Item

Lime - Continued  
 compared with soybean flour as  
 sticker for lead arsenate  
 in spraying fruit,  
 Indiana.....752  
 lead, compared with soybean  
 flour as sticker for  
 lead arsenate in spray-  
 ing fruit, Indiana.....752  
 stone, supplement to soybean  
 oilmeal, hog rations.....1037  
 Lin, F. C.: Soy-bean digest  
 medium for diagnostic work....593  
 Linder, W. V.: Soy bean  
 cheese.....1301  
 Lindsey, J. B.  
 Digestion experiments with  
 sheep.....1158  
 Effect of soy bean meal and  
 soy bean oil upon the compo-  
 sition of milk and butter  
 fat, and upon the consistency  
 or body of butter. With  
 E. B. Holland and P. H.  
 Smith.....994  
 Lindstaedt, F. F.: Adhesive  
 (patent).....1519  
 Lindstrom, E. W.: Selection  
 for quality of oil in soy  
 beans. With L. J. Cole  
 and C. M. Woodworth.....643  
 Ling, S. M.: Changes in the  
 composition of blood in  
 rabbits fed on raw and cooked  
 soybeans. With Ernest Tso...1384  
 Linn County (Missouri) Soybean  
 grower's association,  
 marketing methods.....394  
 Linoleum-like substance,  
 manufacture, process, patent 1569  
 Linseed  
 cake as feed, compared with  
 soybean oilcake.....959  
 export market, affected by  
 introduction of soybean  
 into Europe.....219

Item

Linseed - Continued  
 meal  
 and corn meal, fattening  
 hogs in dry lot less  
 efficient than corn  
 meal and soybean  
 oilmeal.....1104  
 as cattle feed, vs.  
 soybeans.....995  
 bagged, prices, specified  
 markets.....81  
 prices, specified  
 markets.....466  
 protein, more expensive  
 than soybean hay.....1019  
 protein supplement, in  
 dairy ration, compared  
 with coconut meal and  
 gluten feed.....997  
 replaced by soybeans.....303  
See also Linseed, oilmeal  
 oil  
 boiled, bactericidal  
 power.....693  
 fire hazard.....676  
 heat, specific, determina-  
 tion, over temperature  
 range employed in  
 heating them to make  
 industrial products...692  
 imports.....25  
 prices, specified  
 localities.....81,466  
 production.....81  
 purity determination,  
 hexabromide test..632,668  
 Steele and Washburn  
 method and  
 Bailey's modifi-  
 cation of it....,668  
 Steele or Bailey  
 method.....664  
 soybean oil as substitute  
 for, in paint in-  
 dustry.....672  
 substitute needed, because  
 of scarcity with rapidly  
 increasing use.....688



<u>Item</u>	<u>Item</u>
Linseed - Continued	Lipman, J. G. - Continued
oilmeal	Factors influencing the
fed	protein content of soy
dairy cattle	beans: With A. W.
compared with ground	Blair, H. C. McLean
soybeans .....965,	and L. K. Wilkins.....434
977,1009	Listovnich, U. I.: Nitrogen
compared with soy-	metabolism in soybean
bean oilmeal.....965,	feeding of horses. With
977,981	M. F. Gului.....1125
compared with soy-	Littlejohn, C. M.: Soya flour
bean oilmeal and	industry.....1302
ground soybeans...966	Littlejohn, C. N.: Soys for
equal to soybean	robber acres.....799
oilmeal in grain	Liu, Shin-Hao: Effect of soy
rations.....979	sauce on blood sugar and
old process, compared	phosphorus. With A. A.
with peanut meal	Horvath.....1248
and soybean meal..997	Liu, T.: [Nutritive value of
hogs, compared with	soya-bean press-cake.]
soybean oilmeal as	With C. Y. Chen.....911
supplement to	Liverpool University. Institute
corn.....1087,1104	for commercial research in
lamb's	the Tropics. Cultivation and
equals soybean oilmeal	uses of soya beans.....509
and corn gluten	Livestock
meal in protein	farming, and legume cropping,
utilization.....1159	developed farm from run-
with shelled corn	down condition,
and soybean	Wisconsin.....774
straw.....1156	fed
feeding value, compared	soybean oilmeal, value not
with expeller process	understood.....1011
soybean oilmeal.....944	soybeans.....4,921
proteins	appearance improved...889
inferior to those of	pastured on soybeans,
soybean oilmeal.....1162	profits.....787
nutritive value compared	production, economical,
with corn gluten	brought about by reduced
meal and soybean	cost of production of
oilmeal.....1162	soybeans.....814
See also Linseed, meal	See also Calves; Cattle;
Lipman, J. G.	Hogs; Horses; Lambs;
Factors influencing the pro-	Mules; Sheep
tein content of soybeans.	
With A. W. Blair.....435	

## Item:

- Livshitz, M. I.: Ueber die zubereitung des kefirs und des kases aus der sojamilch. With L. M. Horowitz-Wlassowa.....1244
- Lloyd, J. H. Aims and purposes of the Soybean marketing association.....4b
- Soybean production and marketing.....406
- Lloyd, J. W.: Behavior of soybeans as a vegetable crop.....4e
- Lloyd, W. H.: Let George do it and he did!..136
- Possibilities of the soybean..137
- Locher, B. G.: harvesting soybeans.....350
- Löw, Fritz: Zum problem der uebevölkerung.....1178
- Lohse, H. W.: Soya bean, as a food product and industrial raw material.....529
- London, E. S.: Verdauung und resorption von gerichten aus sojabohnen im menschlichen organismus. With N. I. Schochor, A. G. Gagina, A. I. Kolotilowa, R. M. Kutok, E. A. Markarjan, and L. W. Popel.....1303
- Long, J. S.: Studies in the drying oils. XVIII. Specific heat and features of heating drying oils. With J. B. Reynolds and Joseph Napravnik.....692
- Longwell, J. H. Effect of soybeans and soybean oil meal on quality of pork. With Sleeter Bull, W. E. Carroll, F. C. Olson, and G. E. Hunt.....1039
- Soybean test compares hogging-down vs. dry lot. With W. E. Carroll, R. A. Smith and Sleeter Bull.....1042

## Item

- Loomis, H. M.: Food products from soy beans.....1304
- López Sena, Emma, tr. Utilización de la Soya.....534
- Lothrop, Leon: Soya beans.....138
- Lougee, E. F.: Industry and the soy bean.....594
- Louisiana.....208, 305, 314, 319-320, 617, 743, 758, 794-795, 800, 879, 1016-1017, 1038
- Louisiana. Agricultural experiment station.....117
- Corn and soybean production.....305
- Effect of soybeans on corn yields.....748
- experiments on hogging down corn and soybeans.....1038
- "Hogging down crops".....314
- Machine dried soybean hay for fattening cattle.....1016
- soybean hay feeding trials with beef steers.....1017
- Louisiana. Rice experiment station.....795
- experiments on rice and soybean rotation.....794
- experiments on soybean rotation with rice.....758
- Louisiana State penitentiary, Baton Rouge, La., use of soybeans.....617
- Louisiana State university and agricultural and mechanical college. Soybeans.....800
- Louisiana State university and agricultural and mechanical college, Extension service. Biloxi soybean.....794
- Lovell, J. H.: Soy bean as a honey plant.....530
- Lovvorn, R. L.: I. Factors in soybean production; II. Variety recommendations and characteristics. With P. H. Kime and R. E. Stitt.....801



Item	Item
Lütkefels: Die einwirkung der sojakuchen auf die milchkühe und die milch.....996	McCarroll, R. H.: Increasing the use of agricultural products in the automotive industry.....48
Luk'ianov, N.: estimation of the soybean crop.....177	McClain, R. E.: Soybean hazard.....483
Lunde, L. A.: Soybeans as a home-grown supplement for dairy cows. With A. C. McCandlish and Earl Weaver.....998	McClelland, C. K. Soybeans. With D. J. Burleson.....24
Lyman, J. F.: Digestibility of soy bean meal by man. With W. G. Bowers.....1305	Speaking of soy beans.....140
Lynch, R. I.: Soy bean.....531	McComb, A. H.: Process for treating soya beans and like legumes (patent).....1520
M., I. J.: Hog grower's de- light.....1076	McCuen, G. W.: Hints for soy- bean threshing.....365
M., J. W.: Value of soy beans.....912	Macdonald, A. B.: Ninety-day soys.....803
Ma, Y. M.: Hydrogenation of soybean oil. With A. H. Gill.....1225	MacDonald, Pearl: Soybean as human food.....209
McArthur, William.....804,950	McGovran, E. R.: Progress in control of codling moth in 1934. With W. P. Flint, S. C. Chandler, and M. D. Farrar.....662
Soybeans as emergency hay crop.....913	McGuire, R. F.: Soybean values.....141
Soybeans make hay on short notice.....914	McGuire, W. C.: Growing and handling soybeans.....407
Ten years of soybean experi- ence.....139	McInnis, E. C.: Soybeans and corn in the Mississippi Delta.....4
McAuliffe, J. C.: Soya bean as a new world food crop.....1306	McKaig, Nelson, Jr.: Studies of soybeans and other green manure crops for sugarcane plantations. With George Arceneaux and I. E. Stokes.....740
Macbeth lamp, used in soybean oil refining readings.....730	Mackey, A. K.: Soybean crop for fattening western lambs. With W. G. Kammlade.....1155
McC., J. W.: Utilization of the soy bean crop.....802	McKinney, L. L.: Protein plastics from soybean products, With A. C. Beckel and G. H. Brother.....570
McCandlish, A. C. Coconut meal, gluten feed, peanut meal, and soy bean meal as protein supplements for dairy cows. With Earl Weaver.....997	McKinney, R. S. Determination of the oil content of soybeans. With J. L. Carter and G. S. Jamieson.....436
Soybeans as a home-grown supplement for dairy cows. With Earl Weaver and L. A. Lunde.....998	
McCarroll, Hudson: Address...at Illinois farmers grain dealers convention, Chicago Chicago.....595	

<u>Item</u>	<u>Item</u>
McKinney, R. S. - Continued	Molin, D. F.
Oil content of nine varieties	"Bill" McArthur's soy
of soybean and the character-	beans.....804
istics of the extracted	Soy beans as a corn
oils. With G. S.	substitute.....143
Jamieson and W. F.	Malkomesius, Ph.: [New studies
Baughman.....428	of the feeding value of
McLean, H. C.: Factors in-	different soybean extraction
fluencing the protein	residues.] With F. Honcamp,
content of soy beans.	W. Helms, O. Meier, and
With J. G. Lipman, A. W.	K. Naumann.....900
Blair, and L. K. Wilkins.....434	Mallèvre, A.: Les expériences
MacLeod, Grace	danoises concernant la
Maintenance values for the	valeur des tourteaux de
proteins of milk, bread-	soja pour l'alimentation des
and-milk, meat, and soy	vaches laitières, et
bean curd in human	l'influence qu'ils exercent
nutrition. With M. S.	sur la qualité du beurre....999
Rose and Bertha	Malott, D. W.: Problems in
Bisbey.....1349	agricultural marketing.....408
Maintenance values for the	Malted food, production,
proteins of milk, meat,	process, patent.....1607
bread and milk, and soy	Manchoukuo <u>See</u> Manchuria
bean curd. With M. S.	Manchuria..28,98,144,169,188,194,
Rose.....1350	200,211,220,246,262,405,
Macoupin County, Ill.....759	410-411,413,451,477,484,
McRostie, G. P.: Soybeans in	547,702,737,1022,1256
Canada. With R. I. Hamilton,	dominance, soybean axis
F. Dimmock, and S. E.	of struggle for.....200
Clark.....142	events in, effect on
McSorley, E. R.: Food product.	soybean supplies and
(patent).....1521	prices.....144
McVey, E. J.....1030	repercussions in soybean
Mader, A.	oil market.....144
Die behandlung der pyurie mit	Manila medical society.
soja.....1307	Symposium on nutrition.....1201
Die behandlung der säuglings-	Mann, L. B.: Experiment compar-
pyurie mit soja und ihre	ing velvet bean meal, tank-
wechselbehandlung.....1308	age and soy bean meal as
Madrid, F. J.....324	supplements to corn meal
Maine. Agricultural experiment	in feeding hogs. With
station	E. S. Good.....1058
experiments with soybeans..301	Mansfield, O. W.: Growing
Soy beans in Maine.....301	soybeans with corn.....145
Maize <u>See</u> Corn	Margarine, nutritive value,
Makino, Magotaro: Soy-bean	compared with butter, ex-
food (patent).....1522	periments on white rats....1335



<u>Item</u>	<u>Item</u>
Mark, P. L. experiences in harvesting soybeans, Franklin Co., Ohio.....178 Sensible talk about soy beans.....805	Maryland. Agricultural experiment station. Ground versus unground soybean hay for dairy cows.....987 Soybean pasture for fattening hogs.....1041 Soybeans.....828 Soybeans: production, composition and feeding value.....809
Markarjan, E. A.: Verdauung und resorption von gerichten aus sojabohnen im menschlichen organismus. With E. S. London, M. I. Schochor, A. G. Gagina, A. I. Kolotilowa, R. M. Kutok, and L. W. Popel.....1303	Maryland. University. College of agriculture. Soybeans for hay and seed.....372
Markets, Oriental, opened up for U. S. products, through return shipping space after importing soybeans.....188	Mashino, Minoru On the properties of soya bean protein. With Toru Iimuna.....588 Studies of the soya- bean proteins.....437
Markley, K. S.: Soybean oil varnishes. With A. J. Lewis.....691	Massachusetts.....1,75,521,863, 994,1158,1262
Markuze, Zofja: Biological values of the proteins of breads baked from rye and wheat flours alone or combined with yeast or soya bean flour. With S. K. Kon.....1287	Massachusetts. Agricultural college, Extension service. Soy bean.....75 Soybean in Massachusetts...1
Marlatt, A. L.: Soybean dishes new and old.....1309	Massachusetts. Agricultural experiment station. Effect of soy bean meal and soy bean oil upon the composition of milk and butter fat, and upon the consis- tency or body of butter.....994
Marshall County, Tennessee.....91	Soy beans and soy bean oil.....521
Martin, Brice: Harvesting soybeans.....366	Soy beans as human food.....1262
Martin, Edgar: Use of forage crops for growing and fattening swine.....1077	Soybeans for Massachusetts.....863
Martin, J. H.: Harvesting small grain, soybeans, and clover in the corn belt with combines and binders. With L. A. Reynoldson and W. R. Humphries.....376	Massachusetts (Hatch) Agricultural experiment station. [Nutri- tive value of soybean silage].....1158
Maruri, Aurelio: Cultivo del frijol soya.....596	Masé, S. M.: Soybean extract as a defloculating and de- colorizing agent.....598
Maruyama, Yôjirô: Plastic material from soy bean. (patent).....1523	
Maryland....350,372,809,828,987,1041	

Item	Item
Matenaers, F. F.: Die sojabohne, ihre kultur und wirtschaftliche bedeutung.....146	Mayse, A. G.....47,236
Mathews, I. J. Corn-soybean combination.....806 Crop that gives grain and hay.....915	Mazzetti, Giuseppe: Ulteriori osservazioni sul potere battericida dell'olio di lino cotto e di altri olii vegetali.....693
More soybean questions.....147 Some soybean experiences.....315 Soybean facts for winter.....1078 Soybean questions.....807 Soybeans in the rotation.....808 Soybeans will balance the hog ration.....1079	Meade, DeVoe: Ground versus unground soybean hay for dairy cows. With L. W. Ingham.....987
Matsumoto, Hiide.....610	Meal, containing seeds other than soybeans sometimes poisons cows and affects butter taste.....1034
Matsumoto, Tyui: Utilization of waste liquors from soy beans. With Torazo Nishimura and Tojiro Kawakami (patent).....1544	Meat proteins maintenance value in human nutrition.....1349-1350 replaceable to certain extent by soybean protein.....1376
Matsuoka, Chokichi: Japanese soy and method of making same (patent).....1524	scraps
Maucher, J. V., Jr.....967	replaced by soybean oil-meal in poultry feeding.....1137 starting ration of chicks, nutritive value, compared with soybean oilmeal and bone meal of Polish origin.....1130 supplement to cereal grains, in rations of laying pullets....1140 supplement to corn in chick rations, compared with soybean protein.....1139
May, O. E.....231,590 Research program of the Regional soybean industrial products laboratory.....4d	See also names of kinds of meat
U. S. Regional soy bean industrial products laboratory.....600	Mecheels, Otto: Lecithin in der textilindustrie.....599
U. S. Regional soybean industrial products laboratory, Urbana, Ill.....4e	Meggee, C. R.
Mayer, I. D.: Harvesting soybeans with the combine.....4a,367	Curing soy bean hay. With H. L. Dunton.....353
Maynard, L. A. Nutritive value of the proteins of corn-gluten meal, linseed meal, and soybean-oil meal. With K. L. Turk and F. B. Morrison.....1162	Soybean production in Michigan.....532 Soy beans.....148
Relative efficiency for growing lambs of the protein in rations supplemented by soybean-oil meal, linseed meal, or corn-gluten meal. With J. I. Miller and F. B. Morrison.....1159	



<u>Item</u>	<u>Item</u>
Meharry, A. P., success with soybeans.....237	Menhaden oil, fire hazard same as linseed oil.....676
Meharry, C. L.	Mergell, Arnold: Process for the production of stable water-containing emulsions of vegetable lecithin [from soya beans]. With F. W. Engelmann, M. J. Brinckmann, August Brinckmann, and Fritz Mergell (patent).....1467
Eight years growing soy beans.....149	Mergell, Fritz: Process for the production of stable water-containing emulsions of vegetable lecithin [from soya beans]. With F. W. Engelmann, M. J. Brinckmann, Arnold Mergell, and August Brinckmann (patent).....1467
farm, Champaign County, Ill...776	Metallgesellschaft aktiengesellschaft. Process for the production of stable mixtures containing vegetable lecithin with or without soya oil. With Albert Datz (patent)..1530
methods in producing soybeans.....83	Metropolitan life insurance company, Policyholders' service bureau. Report on soy beans and soy bean oilmeal.....150
Twenty years with soybeans.	Metzger, J. E.: Soybeans: production, composition and feeding value. With M. G. Holmes and Harlow Bierman.....809
Conclusions derived from experience on Meharry Farms. With W. E. Riegel, L. J. Withrow, E. N. Stafford, and J. M. Crumbaker.....4a	Miami County, Ind.....327
Meier, O.: [New studies of the feeding value of different soybean extraction residues.] With F. Honcamp, W. Helms, Ph. Malkomesius, and K. Naumann.....900	Michigan..148,258,353,532,559,590,594-595,617,709,768,860,1498
Melhuish, W. J.	Michigan. Agricultural experiment station.....353
Artificial milk from soy beans (patent).....1525	Cowpeas, soy beans and winter vetch.....258
Manufacture of soya bean milk and the complete utilisation of by-products. (patent).....1526	Soybean production in Michigan.....532
Manufacture of vegetable milk and its derivatives (patent).....1527	Soy beans.....148
Process for the manufacture of artificial milk, and the treatment of its residues. (patent).....1528	Michigan. Engineering experiment station. Use of soy bean oil as a core binder.....709
Substitute for milk made from soya beans and arachis [pea] nuts (patent).....1529	
Mendel, L. B.	
Continuation and extension of work on vegetable proteins. With T. B. Osborne.....1326	
Food value of soy bean products. With T. B. Osborne.....1327	
Use of soy bean as food. With T. B. Osborne.....1328	

<u>Item</u>	
Michigan. State board of agri- culture. Soy beans.....	148
Middle Western States.....	54,126
See also Corn Belt	
Middlings, supplement to corn, in hog rations, compared with soybeans and tankage....	1103
Mid-State soybean association....	4a
Midwestern conference of agri- culture, industry and science, Omaha, Neb., 1937. Condensed proceedings.....	600
Mighell, Albert: Soybeans in Iowa farming. With H. D. Hughes and F. S. Wilkins.....	151
Milk	
acidophilus, manufacture, method, patent.....	1499
adulterated with soybean milk, detection.....	1277
advantages of soybean milk over.....	1321
affected by soybean oilcake in dairy ration.....	996
artificial, from soybeans and similar oil-bearing seeds, patent.....	1589
bone building properties, compared with soybean milk.....	1194
compared with soybean milk...	297, 1206,1259,1344
condensed, and soybeans in infant feeding.....	1355
digestibility compared with soybean milk powder.....	1343
dried	
pellagra-preventive action	1228
whole, source of vita- min G.....	1299
effect of ground soybeans in dairy ration on.....	962
fat content, effect of soy- beans in dairy ration on..	1030
feeding trials, weight gained greater and with more ef- ficiency than with soybean milk.....	1236

<u>Item</u>	
Milk - Continued	
nutritive properties, com- pared with soybean milk.....	1236,1385
powder	
nutritive value, compared with soybean milk....	1403
vitamin B <sub>1</sub> and B <sub>2</sub> content, compared with dried soybeans.....	1402
production	
comparative value of peanut and soybean hay.....	970
cost	
reduced by use of ground soybeans in dairy ration...	1002
when cows fed soybean oilmeal and cottonseed meal rations.....	963
with home-grown rations, compared with purchased rations.....	1004
cows fed soybean oilmeal and cottonseed meal rations.....	963
effect of peanut and soybean hay on.....	971
effect of soybean hay compared with alfalfa hay on.....	955
effect of soybean oilcake fed to cows on.....	1022
effect of whole and extracted soybeans on.....	985
increased, methods of obtaining.....	987
maximum and economical, protein-carrying con- centrates and leguminous roughages best adapted for.....	986



<u>Item</u>	<u>Item</u>
Milk - Continued	Miller, E. W.: Cheap homemade soybean meal for diabetics.
protein	With L. J. Roberts.....1348
content equalled by	Miller, H. W.: Process of making vegetable milk [from soy beans].
soybean milk.....1236	(patent).....1531
digestibility, experiments	Miller, J. I.: Relative efficiency for growing lambs of the protein in rations supplemented by soybean-oilmeal, linseed meal, or corn-gluten meal. With F. B. Morrison and L. A. Maynard.....1159
with albino rats.....1164	Miller, J. Z.....987
maintenance value in	Miller, K. C.: Soybeans feeding tests.....1080
human nutrition...1349-1350	Miller, M. F.....769
quality, effect of soybean	Miller, R. T.: Work of the agronomic and analytical divisions of the U. S. Regional soybean industrial products laboratory. With J. L. Cartter.....4e
oilcake fed to cows on....1022	Millet seed.....473
separated, role in chick	Mills, Z. R.: Commercial growing of soybeans in Iowa.....152
nutrition.....1141	Milner, R. T.: Occurrence of phosphorus in soybeans. With F. R. Earle.....652
skin	Milquid Ltd., Canada, manufacturers of soybean milk and flour.....529
fed to hogs as supplement	Minami Maushu Tetsudo Kabushiki Kaisha, Dairen, Manchuria..1567
to corn, Georgia.....1052	Minatoya, S.: Effect of soya-bean-lecithin on vulcanization of rubber, and the manufacture and uses of powdered rubber prepared by the use of soya-bean-lecithin. With N. Kurahashi.....601
in calf feeding, compared	Minerals
with soybean gruel.....1012	role in chick nutrition....1141
substitute	supplement in fattening hogs, feeding trials.....1117
made from soybeans and	
peanuts, patent.....1529	
manufacturing, process,	
patent.....1600	
soybean egg powder, in	
infant dietary.....1342	
soybean flour.....1364	
in feeding dairy	
calves.....1013-1014	
soybean milk	
complete, impossible...1259	
further work needed	
before recom-	
mended .....1403	
value, marketing, lowered,	
through undesirable flavors	
caused by soybeans.....1001	
vegetable, manufacture,	
process, patent.....1482,1598	
whole, use in calf feeding,	
compared with soybean	
gruel.....1012	
<u>See also</u> Soybean milk	
Miller, C. D.: Nutritive value of green immature soybeans. With R. C. Robbins.....1310	
Miller, E. E.: When the soy beans are harvested.....368	

<u>Item</u>	<u>Item</u>
Minneapolis. Board of grain appeals. Minnesota grain grades for the 1937-38 crop year.....332	Mississippi. Delta Experiment station. experiments in planting soybeans and oats.....6
Minnesota.....5, 31, 332, 400, 590, 616, 658, 781, 1009-1010, 1049, 1051	experiments in varietal production.....112
Minnesota. Agricultural experiment station. experiment in feeding soy- bean oil meal to hogs..1049	Mississippi Delta.....4, 355
soybean feeding experiments with pigs.....1051	Missouri...64, 111, 122, 154, 287, 311- 312, 357, 363, 380, 394, 590, 769- 770, 779, 840-841, 1043-1044, 1072, 1095, 1119-1120
Soybeans and soybean hay in the dairy ration....1009	Missouri. Agricultural experiment station.....769, 1095
Minnesota. University. Department of agriculture. Soybeans for Minnesota. rev.....5	Composition of soybean plants at various growth stages as related to their rate of decomposition and use as green manure.....841
Minnesota. University. Department of agriculture, Extension division. Grow more soybeans in Minnesota.....5	Corn and soybeans.....770
Soybeans for Minnesota.....5	Cost of producing some Missouri farm crops...311
Soybeans; their use and culture in southern Minnesota.....781	Cost of production on Missouri farms.....312
Minns, E. R. Soy beans.....153	Hogging down corn and soybeans.....1119
Soy beans as a supplementary silage crop.....810	Productive methods for soybeans in Missouri...64
Miso See Soybean cheese	Soybean crop in Missouri 122
Mississippi.....5-6, 71, 112, 203, 371, 440, 741, 1000, 1035-1036	Soybeans and soybean oil meal in swine rations.....1120
Mississippi. Agricultural experiment station. Corn and soy beans for pork production.....1035	Time of harvesting soybeans in relation to soil improvement and protein content of the hay....380
Effect of variety, maturity, and soundness on certain soybean seed and oil characteristics.....440	Missouri. State Board of agricul- ture. Corn in Missouri; also soybeans and cowpeas..111
Grazing and feeding trials with corn and soybeans for pork production....1036	Cowpeas and soy beans....154
Soybeans: Delta branch station.....741	Missouri. University. College of agriculture. Growing soybeans for hay.....357
Soybeans for dairy cows...1000	Soybean hay production...363



<u>Item</u>	<u>Item</u>
Missouri. University. College of agriculture, Extension service. Soybean varieties for seed and hay.....779 Soybeans and winter barley in one-year rotation....840	Mizusawa, Isome - Continued Imitation powdered milk. With Yoshitaro Yamamoto, and the Tokyo Takushoku Kabushiki Kaisha (patent).....1610
• Mitamura, Kentaro: Influence of soy bean cake upon milk pro- duction and the quality of butter. With Eiji Takahashi, Kenzo Iguchi, and Kiyoshi Shirahama.....1022	Moisture testers.....423 Brown-Duvel.....421 electric.....422
Mitarai, H.: Ueber die chemische zusammensetzung der japanischen soja-sauce oder "schōyu". With U. Suzuki and K. Aso....1378	Molasses, used in making soybean silage.....881,882
Mitchell.....984	Molliex, P.: Sur la composition et la valeur alimentaire des germes frais de soja hispidia.....1312
Mitchell, H. H. Amino acid deficiencies of beef, wheat, corn, oats and soy beans for growth in the white rat. With D. B. Smuts.....1311	Monaghan-Watts, Betty: Whipping ability of soybean proteins.....1313
Digestibility and metabolizable energy of soybean products for sheep. With T. S. Hamilton and W. G. Kammlade.....1152	Monahan, L. J. Process of making soy milk. With C. J. Pope (patent)1533 Soy-milk product and process of making the same. With C. J. Pope (patent).....1534
Soybeans found richer in certain vitamins than corn. With J. R. Beadles..916	Monhaupt, Max: Process for the manufacture of a colloidal solution neutral to the taste from casein and vegetable albumen, including gluten(patent)...1535
Mitsubishi Kogyo Kabushiki Kaisha: Briquets. With Masasuke Mitsunaga (patent)..1532	Montana. Agricultural experiment station. Soybeans.....196
Mitsunaga, Masasuke: Briquets. With the Mitsubishi Kogyo Kabushiki Kaisha (patent)....1532	Montgomery, C. W.: Factors af- fecting labor and miscel- laneous costs of producing crops.....316
Miyake, Koji: On the effect of calcium oxide and calcium carbonate upon the decomposi- tion of soy-bean cake and herring cake in two different soils. With Koji Nakamura.....811	Mooers, C. A. Soy bean. A comparison with the cowpea.....156 Soy-bean as a farm crop.....157
Mizusawa, Isome.....1612	Moore, J. L. Comparative values of peanut and soybean hay for milk production. With C. D. Grinnells.....970,971

<u>Item</u>	<u>Item</u>
Moore, J. L. - Continued	Morrison, F. B. - Continued
Peanut versus soybean hay	Relative efficiency for
for dairy cattle. With	growing lambs of the
C. D. Grinnells.....972	protein in rations sup-
Moore, J. S.: Soybeans for	plemented by soybean-
dairy cows. With W. C.	oil meal, linseed meal,
Cowser.....1000	or corn-gluten meal.
Moore, L. C.....47	With J. I. Miller and
Moore, R. A.	L. A. Maynard.....1159
Soybeans - a crop worth	Morrison, H. J.: Report of
growing. With E. J.	Soya bean oil committee.....694
Delwiche.....158	Morse, W. J.
Soybeans - a good legume crop	American soybean associa-
borrowed from the Orient.	tion.....4c
With E. J. Delwiche	Distribution of soybeans
and G. M. Briggs.....159	in the United States.....4
Soy beans - an important	Green vegetable soybeans.....4c
Wisconsin crop. With	Growing soy beans as a
E. J. Delwiche.....160	cash crop.....164
Moorhouse, L. A.: Cowpeas and	Harvesting soy-bean seed....369
soy beans.....161	Hokubei Gasshiu-goku ni
Morgan, H. H.: Soy bean oil.	okeru daizu no seisan
With Firman Thompson.....724	narabini riyo no genkyo.
Morgan, J. H., Jr.: Food product	(Present situation of the
[from the soybean]. With	soybean in the United
J. H. Morgan, Sr. (patent)...1536	States).....165
Morgan, J. H., Sr.: Food product	Illustrated lecture on soy
[from the soybean]. With	beans. With H. B.
J. H. Morgan, Jr. (patent)...1536	Hendrick.....166
Morgan, J. I.....47	Improvement in soybeans.
Morgan, R. H.: Lecithin in	With J. L. Cartter.....167
industry.....1314	La industria del soy bean
Morison, A. T.: Soy succotash	en los Estados Unidos....170
for hogs.....1081	Present outlook of the
Morris, Curtis.	soybean industry in the
Soy bean conference at	United States.....4
Corsicana.....162	Soybean. With C. V. Piper..192
Soy bean greatest natural	Soy bean; a valuable leguminous
food.....533	crop for the north.....812
Morris, H. T.: Story of	Soybean hay and seed
soybeans.....163	production.....168
Morrison.....1032	Soy bean; history, varieties,
Morrison, F. B.	and field studies. With
Feeds and feeding.....917	C. V. Piper.....193
Nutritive value of the	Soy bean in Manchuria.....169
proteins of corn-gluten	Soy-bean industry in the
meal, linseed meal, and	United States.....170
soybean-oil meal. With	Soybean investigations in the
K. L. Turk and L. A.	United States. With G. C.
Maynard.....1162	Fuller.....602



<u>Item</u>	<u>Item</u>
Morse, W. J. - Continued	Moscow. Zentrales biochemisches
Soy bean: its culture and	forschungsinstitut der
uses.....813	nahrungs- und genussmittel-
(cited).....174	industrie.
Soy-bean output increasing	Die gewinnung von
in United States.....171	technischem sojaeiweiss
Soybean utilization.....534	("Rasein") und seine
Soybean varieties and their	verwendung zur
utilization.....172	leinherstellung.....604
Soy-bean varieties newly	Methoden der
developed for U. S. farms..173	feuchtigkeitsbestimmung
Soybean variety studies of	in sojabohnen.....431
the United States Depart-	Ueber die zubereitung
ment of agriculture.....4e	der sojamilch.....1243
Soy bean; with special ref-	Ueber die zubereitung
erence to its utilization	des kefirs und des
for oil, cake, and other	kases aus der
products. With C. V.	sojamilch.....1244
Piper.....194	Verdauung und resorption
Soybeans: Ancient and modern	von gerichten aus
uses.....4c	sojabohnen in
Soy beans: culture and	menschlichen
varieties.....174	organismus.....1303
(cited).....813	Die vergleichenden
Soybeans for feed and	untersuchungen über
fertility.....814	die methodik der
Soy beans in the cotton	asche- und
belt.....535	phosphorbestimmung
Soybeans in the United States.	in den sojabohnen.....432
In relation to world	Moses, A. B.
production and trade.....4d	Process of making a sub-
Soybeans now a major crop	stitute for milk [from
in United States.....175	soya beans, etc.]
Utilización de la soya	(patent).....1537
en diversas industrias.....534	Process of producing
Mortimer, G. B.: If winter	liquid food from
kills your hay.....176	soy-beans (patent).....1538
Moscow. Nauchno-issledovatel'skii	Mühl, E.
institut soi i spetsial'nyk	Der einfluss von nicht
kul'tur.	entfetteten und entfetteten
K uborke urozhaia soi i	sojabohnen auf die
nov'ikh kul'tur.....177	milcherzeugung und die
Soia i nov'ie kul'tur'i....536	butterbeschaffenheit.
Sushka i khranenie	With V. Horn.....985
senian soi. Sbornik	
statei.....485	

Item

Item

Mühl, E. - Continued

Fütterungsversuche mit  
rohen und gekochten  
sojabohnen bei  
mastschweinen. With  
V. Horn.....1068

Muggia, Alberto: Il latte  
vegetale di soia nell'alimenta-  
zione e nella terapia delle  
malattie gastro-enteriche  
dei bambini. With Enrico  
Gasca.....1315

Muir, G. W.: Digestibility  
of Canadian feeding stuffs -  
soybean oil meal. With  
C. J. Watson, J. C. Woodward,  
W. M. Davidson, and C. H.  
Robinson.....944

Mules fed soybean hay.....1123  
fed soybeans.....887, 905, 1122  
See also Livestock

Mullen, F. E.: Soybeans in the  
corn belt.....1082

Mulvey, R. R.: Soybeans in  
Indiana. With A. T.

Wiancko.....848

Mumford, C. W.  
Effect of ground soybeans  
on the cold storage  
quality of eggs. With  
A. E. Tomhave.....1146

Ground soybeans as a protein  
supplement for growing  
chicks. With A. E.  
Tomhave.....1147

Ground soybeans as a supplement  
for laying birds. With  
A. E. Tomhave.....1148

Mumm, W. J.: Bar-cylinder  
soybean thresher. With  
F. L. Winter.....370

Mung beans.....1334

Murakami, Kanekichi: Bean-curd  
and the process for making  
same (patent).....1539

Muramatsu, S.: On the preparation  
of "natto".....1316

Murontsev, V. A.: Technologie  
der herstellung und  
methoden der desodorierung  
der sojamilch. With  
V. D. Bogatskii and M. K.  
Storozhuk.....1182

Musae, P. L.: Bread, biscuits  
and other food products  
containing flours of the  
cane or soy bean  
(patent).....1540

Musher, Sidney: Cereals and  
seeds inhibit rancidity  
in lard.....1317

Mutton  
production, cheap, through  
soybeans.....867

See also Meat

Myer, D. S.: Why not grow  
soybeans?.....178

Naemura, Tokuji: Floor-cover  
composition (patent).....1541

Nakahara, Waro  
Further evidence for  
the occurrence of vitamin  
E in soy bean oil.  
With Umetaro Suzuki and  
Yoshikazu Sahashi.....1379

Occurrence of vitamin E  
in soy bean oil. With  
Umetaro Suzuki and  
Yoshikazu Sahashi.....1380

Nakajima, Kenzo: Studies on  
the proteins and oil of  
soy bean.....438

Nakamura, Koji: On the effect of  
calcium oxide and calcium  
carbonate upon the decompo-  
sition of soy-bean cake  
and herring cake in two  
different soils. With  
Koji Miyake.....811



<u>Item</u>	<u>Item</u>
Naprawnik, Joseph: Studies in the drying oils. XVIII. Specific heat and features of heating drying oils. With J. S. Long and J. B. Reynolds.....692	Neal, W. M. - Continued Soy beans for silage. With R. B. Becker, C. R. Dawson, and P. T. D. Arnold.....864
National broadcasting company....497	Nebraska.....119-120, 247, 590, 600
radio talk on harvesting soy beans.....377	Nebraska. Agricultural experiment station. Soy beans.....119
National fire protection association. Fire hazard of the newer "drying oils".....676	Soy beans and cowpeas....120
Rural soybean plant explosion.....704	Nebraska. University. College of agriculture, Extension service. Soybeans in Nebraska.....247
National hay association. Harvesting and curing soy bean hay.....358	Nelson, E. M.: Chemical study of the ether extracts of soy bean leaves.....695
National soybean growers' association <u>See</u> American soybean association	Nelson, Martin: Soy beans.....180
National soybean oil manufacturers association Code of fair competition...732 defines soybean products..331, 720 official chemists.....718 soybean oil standards.....718 soybean standards.....618 Trading rules (cited).....522	Nelson, W. L.....154
National soybean processors association.....548 annual meeting...1936, account of.....230-231 Trading rules.....409	Nemzek, L. P.....287 Economic possibilities of the soybean.....537 extracts from address before Mississippi cottonseed crushers' association.....668
National varnish manufacturers' association.....632, 664, 666, 696	Production and use of soya bean oil in the United States with a brief history of their development. ....696
Natto <u>See</u> Soybean cheese	Production and use of soya bean oil in U. S.....696
Naumann, K.: [New studies of the feeding value of different soybean extraction residues.] With F. Honcamp, W. Helms, Ph. Malkomesius, and O. Meier.....900	Soya bean and soya oil.....697
Neal, W. M. Chemical study of ensiling soybeans. With R. B. Becker.....918	Soya bean oil: production and uses.....696
	Nestler, R. B.: Effects of light, soybean and other diet supplements on seasonal hatchability and egg production. With T. C. Byerly, H. W. Titus, and N. R. Ellis.....1127
	Netherlands.....1419, 1478-1479
	Netherlands Indies.....61
	Neufeld, M.: Process of producing soybean flour. With H. Heymann (patent).....1490

<u>Item</u>	<u>Item</u>
Neufeld, M., & co. Improvements in or relating to the process of producing soya flour (patent).....1542	New Hampshire. Agricultural experiment station. Soy bean in New Hampshire.....198
Roller apparatus for pro- ducing flakes or flour from soybeans and other seeds (patent).....1543	New Jersey..40,52,181,272,304,317- 318,434-435,834-835,963,992,1401
Verfahren zur herstellung eines nicht bitteren mehles aus sojabohnen. (patent).....1542	New Jersey. Agricultural experiment station.....1401
Werkwijze voor het bereiden van sojameel met neutralen smaak of met een door branden verkregen aroma (patent).....1542	Alfalfa hay, cow pea hay and soy bean silage as substitutes for purchased feeds.....992
Neumann, H.: Der nährwert und die verwendung der sojabohne beim menschen.....1319	Factors influencing the protein content of soy beans.....434
Neumann, R.: Fütterungsversuche mit schweinen über die verdaulichkeit getrockneter kartoffeln und des entfetteten sojabohnenmehls. With O. Kellner.....1073	Report of the Dairy husbandmen.....992
Neumann, R. O.: Die sojabohnen und ihre verwertung im organismus nach stoffwechsel- versuchen am menschen.....1320	Rye straw and soy beans.....181,317
Neuville, A. de: Les nouveaux aliments artificiels.....1321	Soybean in New Jersey....272
Nevens, W. B. Experiments in time of har- vesting soybeans for hay.....4e	Soy bean meal vs. cotton seed meal.....963
Making best use of soybeans in feeding dairy cattle.....4b	Soybeans, cowpeas and Canadian field peas....52
Making use of soybeans in feeding dairy cattle.....904	Soybeans for grain.....835
Relation of soybean hay and ground soybeans to flavor and composition of milk and butter. With P. H. Tracy.....1001	Soy beans for seed.....318
Nevins.....984	New Jersey. Agricultural experi- ment station, Department of farm crops, statement of results for soybeans planted after rye.....181
	New Jersey. Agricultural experi- ment station, Department of plant physiology. Paper no. 273.....426
	New Jersey. State college of agriculture and mechanic arts. Soybeans for New Jersey.....40
	New York (City) produce exchange grades for soybean oil, suggested.....690
	trading rules in oils (cited).....522



<u>Item</u>	<u>Item</u>
New York (Cornell) agricultural experiment station.	Nikitin, A.: [Soy bean and its products from a chemical and dietetic standpoint]...1322
Cayuga soybean: a home-grown high-oil, high-protein concentrate.....284	Nishida, Kotaro: Organic fertilizers. VIII. Soy bean as a green manure. With Kiyohisa Yoshimura and Aritomo Yamada.....856
Combinations of corn and soybeans for silage....1026	Nishimura, S.....437
Corn and soybeans for silage.....946	Nishimura, Torazo: Utilization of waste liquors from soy beans. With Tojiro Kawakani and Tyui Matsumoto (patent).....1544
experiments on corn and soybeans in combination.....947	Nitrates, soil, reduction by maturing soybeans.....766
Soy beans as a supplementary silage crop.....810	Nitrogen
Soy beans as supplemental silage.....812	added to soil by soy-beans.....790,823-824
Varietal experiments with soybeans in New York....285	Texas.....46
New York (Cornell) State college of agriculture, Ithaca.	<u>See also</u> Soybeans, effect on soil
Department of plant breeding..849	maintenance by soybeans.....769
Paper	metabolism, horses fed soybeans, increased.....1125
no. 211.....1026	Noblee & Thörl G.m.b.H.
no. 216.....849	Lecithin (patent).....1545
New York (State) 87,153,190,255-256, 284-285,385,477,694,790,805, 810,812,849,862,866,912,946-948,953,1026,1159,1363	Process for the production of storable mixtures of lecithin and oil (patent).....1546
New York (State) Agricultural experiment station. Soybean and cowpea.....87	Soybean oil. (patent).....1547
New York (State) Dept. of agriculture. Soy beans.....153	Noll, C. F.
Newton, C. B.....397	Soy beans. With R. D. Lewis.....455
Nicaragua.....221,257	Soy beans for Pennsylvania..182, 815
Nicaragua. Ministerio de agricultura y trabajo. Soya o soja.....221	Soybeans: their culture and uses. With R. D. Lewis.....183
Nichols, N. B.: Nutritive value of the soy bean. With A. L. Daniels.....1205	Norris, L. C.: Effect of heat on nutritive value of soy-bean meal. With H. S. Wilgus, Jr., and G. F. Heuser.....1149
Nielloux, F.: La lécithine végétale de soja. With F. Rothéa.....608	North, J. L.....80
Nielsen, Carl: Vegetable milk. With A. S. Burdick (patent)..1444	North Carolina...4,90,214,292-293, 295,299,309,350,374-375,489, 562-563,565,698-699,801,971, 1060,1069,1135,1161
Nielsen, H. T.: Soy beans. With C. V. Piper.....822	

Item

Item

North Carolina. Agricultural experiment station.  
 Comparative values of  
 peanut and soybean  
 hay for milk production 971  
 Cost of producing farm  
 products in North  
 Carolina.....309  
 I. Factors in soybean  
 production; II. Variety  
 recommendations and  
 characteristics.....801  
 Soy bean growing in  
 North Carolina.....293  
 Soy bean hay versus alfalfa  
 hay for winter main-  
 tenance of sheep.....1161  
 Soybean oil meal for  
 fattening pigs.....1069  
 Soybean pastures for  
 hogs.....1060  
 Soy-bean products and  
 their uses.....563  
 Soybeans: a future  
 economic factor in  
 North Carolina.....565  
 Soybeans and cowpeas for  
 North Carolina.....90  
 North Carolina. Agricultural ex-  
 periment station, Coastal  
 branch experimental plant.  
 soybean feeding experiments  
 with chickens.....1135  
 North Carolina State college of  
 agriculture and engineering.  
 Commercial use of the  
 soybean.....699  
 Soybean growing in North  
 Carolina.....292  
 North Carolina State college of  
 agriculture and engineering,  
 Extension service.  
 Soybean harvesters....374,375  
 Soy bean industry of  
 eastern North Carolina..562  
 Soybean pastures for  
 hogs.....1060

North Carolina State college  
 of agriculture and engineer-  
 ing, Extension service -  
 Continued  
 Soybeans for the Piedmont  
 and mountain sections  
 of North Carolina.....299  
 North Dakota.....590,688,  
 736,1141,1183  
 North Dakota. Agricultural  
 experiment station.  
 Some studies on the  
 nutritive value of the  
 soy bean in the human  
 diet.....1183  
 Soya bean oil.....736  
 North Dakota. Agricultural  
 experiment station, Food  
 dept. Soya bean investiga-  
 tion.....688  
 Northern States.....4,304,725,873  
 Northumberland County, Eng.,  
 Educational committee. Palm  
 kernel cake, palm kernel  
 meal, and cocoanut cake,  
 compared with soya cake, for  
 fattening cattle, young store  
 cattle, and fattening  
 sheep, 1915-1916.....885  
 Norton, L. J.  
 Soybean marketing outlook...410  
 Supply and marketing of soy-  
 beans and soybean products.  
 With C. L. Stewart, W. L.  
 Burlison and O. L.  
 Whalin.....245  
 Norway.....1487,1525  
 Novelle, Georges: Les emplois  
 du soja.....1323  
 Novopan Studiengesellschaft, n.b.H.  
 Bread, etc., for diabetics  
 (patent).....1548  
 Bread for diabetics  
 (patent).....1549  
 Novotel'nov, N. V.: Soybean  
 enzymes and their  
 activity.....1298



<u>Item</u>	<u>Item</u>
Novo-tropon	Oats - Continued
source of protein in diets....1276	grown on alternate plots
See also Soybean flour	with soybeans, feed
Nusoy See Soybean flour (Nusoy)	value.....455
Nutrition, Japanese investiga-	Pennsylvania.....183
tions.....1329	in rotation
Nuts, oil extraction, method,	compared with soybean
patent.....1464	rotation.....455
	Pennsylvania.....183
Oakley, R. A.: Seed supply of	replaced by soybeans.....767
the nation.....184	meal, vitamin A and B
Oat hay	content.....857
food content, compared with	net energy value See Oats,
soybean hay.....299	ground, calory content
See also Hay; Soybean hay	profits, less than
Oathout, C. H.: Vitality of	soybeans.....414
soybean seed as affected by	replaced by soybeans.....72,
storage conditions and	276,290
mechanical injury.....486	Piatt County, Illinois....14
Oats	result of contract
amino acid deficiency for	guaranteeing definite
growth in white rat.....1311	price per acre.....400
Delta Experiment Station,	Wapello Co., Iowa.....291
Miss.....6	See also Grain
economic difficulties with	Oberhard, I. A.
crop, causing increased	Preserving soybean-milk
interest in soybeans,	residue for use in making
Illinois.....86	crackers. With E. K.
effect on soil.....767	Kiseleva.....1298
effect on succeeding crop.....767	Simplified method for roasting
farm value, compared with	soybeans with sugar.
soybeans.....455	With E. G. Khaletzkaya..1298
fed	Ueber die zubereitung
hogs.....1077	der sojamilch. With
horses	L. M. Horowitz-Wlassowa
with corn and soybeans 1122	and B. I. Gutermann.....1243
with soybean hay and	Obesity, use of soybean bread
corn.....1123	for.....1358
lambs, compared with	O'Brien, H. R.
soybeans as supplement	Soy-bean magic.....919
to corn.....1160	Soy bean proteins.....49
ground	Soy beans for profit.....185
calory content.....967	Visit to Soyland.....816
in dairy ration, with	Odland, T. E.: Soybeans for
cracked soybeans,	silage and for hay.....920
alfalfa hay, corn	Odle, L. A.: Soy beans for
silage, and cracked	stock feeding.....921
corn.....998	

<u>Item</u>	<u>Item</u>
Ohio....106,126,137,178,253,254,256, 308,316,321,347,365,373,389-390, 439,515,517,548,590,744-745,791, 807,818-820,829,854,893,897,924, 935,939-940,951,960,968,975-977, 1084-1085,1087-1089,1091-1093, 1095-1096,1106,1183,1305,1318, 1331	Ohio. Agricultural experiment station - Continued
Ohio. Agricultural experiment station.....1318	Soybean hay and soybean silage.....897,976
Alfalfa and soybean hay for growing heifers.....975	soybean hog feeding tests.....1085,1089
Comparison of soybean oilmeals for supple- menting corn for hogs.....1084	Soybean in Ohio.....253
Corn and soybean combina- tion.....744	Soybean oilmeal hog feeding tests.....1088
experiment on soybean oilmeal as cattle fattening rations.....968	Soybeans and soybean oilmeal for milk production.....977
experiments on feeding value of soybean oilmeals extracted by different methods.....924	Soybeans and soybean oilmeal for pigs....1091- 1092
Experiments with growing corn and soybeans in combination.....745	Soybeans for feeding hogs.....1093
Factors affecting labor and miscellaneous costs of producing crops.....316	Soybeans in corn for hogging-down.....1095
Feed merchants' day.....935	Soybeans: their culture and uses.....296
Growing soybeans in corn...818	Status of the soybean crop in Ohio.....254
Harvesting soybeans for hay.....389	Supplements to corn for fattening swine.....1096
hogging down experiments with soybeans and corn vs. rape and corn.....1106	Value of soybean and alfalfa hay in milk production.....960
Life history and composition of the soybean plant.....347	Yields obtained in ex- periments at Wooster..939
Protein and oil content of soy beans.....439	Ohio. Agricultural experiment station, Department of agronomy, questionnaire sent soybean growers.....254
Soy bean.....853	Ohio State university. Soy- bean hog feeding experi- ments.....1066
Soybean and cowpea.....854	Ohio State university, College of agriculture. experiment on soybeans in rotation.....321
Soybean field day.....126	Ohio State university. College of agriculture, Department of farm crops. Time of harvesting soybeans for hay and seed.....390



<u>Item</u>	<u>Item</u>
Ohio State university, College of agriculture, Extension service.-	Oil seeds - Continued
Harvesting soybeans for seed.....373	outlook charts.....466
Soybean.....819	phosphatides from, purification, patent....1434
Soybean and soil improve- ment.....829	production for oil mills.....4
Soybean hay.....951	treatment, patent.....1411, 1487,1518,1590,1605
Varieties of soybeans for Ohio.....820	<u>See also</u> Oils and fats, vegetable; Soybeans; etc.
Ohio State university, Laboratory of chemistry and soils.....1305	Oils and fats.....501
Oilcake	animal
adaptation for human food, process, patent.....1469	and vegetable
<u>See also</u> Soybean oilcake	interchangeability....733
Oilmeal.	principal
in dairy ration	imports.....478
.. compared with cracked soybeans fed with corn	revenues derived
.. silage, alfalfa hay, cracked corn and	from.....478
ground oats.....998	commercial.....690
gave six percent more milk and eight percent less fat than soy- beans.....993	changes
vs. soybeans.....993	upon ageing.....671
<u>See also</u> Soybean oilmeal	upon storage.....668
market demand, large, indi- cates market for soybean	commercial.....690
products.....164	fire and explosion
utilization in glue, patent..1554	hazards.....734
<u>See also</u> Soybean oilmeal	consumption
Oil, paint and drug reporter.	drying industries.....466
Green book buyers	lard-substitute, oleo-
directory, 1937-38.....538	margarine, and soap
Oil seeds.....12,1317	industries.....477
Far Eastern.....263	drying, heating, specific
manufacture of foodstuffs	heat and features.....692
from patent.....1431	economic factors.....733
market in United States,	edible.....1214
should be investigated by	extraction, continuous
importers of Far Eastern	solvent, apparatus and
products.....263	method, patent.....1472
	hydrogenated, food value...1390
	imports.....474
	interchangeability.....494
	economic factors
	affecting.....733
	with other commodities...733
	milling industry
	importance to large-scale
	production of
	soybeans.....656
	soybean utilization.....656

<u>Item</u>	
Oils and fats - Continued	
not in chaulmoogra group,	
effect on leprosy.....	1399
self-sufficiency.....	478
mineral, emulsified by	
soybean oilmeal for dormant	
spray purposes.....	657
modified, patent.....	1587
Oriental.....	690
prices.....	478, 733
production.....	478
costs.....	733
Tariff Commission's	
report to Congress...	144
transportation, costs.....	733
Tariff Commission's	
report to Congress.....	144
vegetable.....	501
bactericidal power.....	693
characteristics.....	706, 733
commercial.....	690
consumption.....	474
crude, prices.....	467-468
f.o.b.....	466
digestibility.....	1240
extraction	
machinery and processes	706
patent.....	1464
interchangeability with	
animal oils.....	733
listed.....	706
market demand, large,	
indicates market for	
soybean products.....	164
olive, vitamin A content,	
conclusions from	
clinical studies with	
infants.....	1226
producing crops, encouraged	
by restriction of copra	
and palm oil imports.....	82
production.....	474, 478
mechanical point of	
view.....	706
trade, foreign.....	478
refining.....	706
sources.....	706
stocks.....	474
uses.....	706, 733

<u>Item</u>	
Oils and fats - Continued	
vegetable - continued	
uses - continued	
in enamels and	
varnishes.....	686
industrial.....	706
<u>See also</u> Soybean oil	
whale, uses.....	733
<u>See also</u> Soybean oil	
Okada, Teppei: Soluble	
protein. With Magosabuto	
Omura (patent).....	1551
Okamura, Zensaku: On the	
nutritive value of	
hydrogenated oils. With	
Seiichi Ueno, Matasaku	
Yamashita, and Yasuo	
Ota.....	1390
"Okara" <u>See</u> Soybeans, uses, food,	
"Okara"	
Okazaki, Keiichiro: Process of	
manufacturing soy or sauce	
substitute (patent).....	1550
O'Kelly, A. A.: Nutritive pro-	
tein of some newly developed	
soy beans. With Watt Smith	
and R. C. Wilson, Jr.....	1324
O'Kelly, J. F.: Effect of	
variety, maturity, and	
soundness on certain soybean	
seed and oil characteristics.	
With M. Gieger.....	440
Oklahoma.....	121, 161, 186, 446
Oklahoma. Agricultural experi-	
ment station. Soybeans for	
Oklahoma.....	121
Oklahoma academy of science.	
Oil and protein studies	
of Oklahoma grown soy	
beans.....	446
Oklahoma City Chamber of	
commerce.....	186
Oklahoma farm chemurgic con-	
ference. 1st, Oklahoma City,	
1937. Proceedings.....	186
Oldenburg, F. W.: Soybeans for	
hay and seed.....	372



<u>Item</u>	<u>Item</u>
Oliveros, S. B.: Physical characteristics and chemical composition of various brands of toyo (soy sauce) sold in the Philippines. With F. T. Adrianao, D. S. Santos, and E. R. Villanueva.....1170	Oshima, Kokichi: Promising development of soya bean sauce.....1330
Olson, F. C.: Effect of soybeans and soybean oil meal on quality of pork. With Sleeter Bull, W. E. Carroll, G. E. Hunt, and J. H. Longwell.....1039	Osterberger, C. L. Producing corn and soybeans with mechanical power....319
Olson, T. M.: Soybeans for dairy cows.....1002	Utilization of power and power equipment in corn and soybeans .....320
Omura, Magosaburo: Soluble protein. With Teppei Okada. (patent) .....1551	Ostrander, W. A. Legume crop for soils and stock.....817
Oniki, Manjiro: Rice for manufacturing soy (patent).....1552	Soy beans assure legumes for dairy farms.....187
Ontario, Canada.....31,242	Ota, Yasuo: On the nutritive value of hydrogenated oils. With Seiichi Ueno, Matasaku Yamashita, and Zensaku Okamura.....1390
Ornstein, A.: Manufacture of a clarifying agent for wine, vinegar and similar liquids (patent).....1553	Otis, D. H. New drought-resisting crop - soy beans. With H. M. Cottrell and J. G. Haney.....38
Orosa, M. Y.: Soy beans as a component of a balanced diet and how to prepare them.....1325	Soy beans in Kansas in 1900. With H. M. Cottrell and J. G. Haney.....39
Osaka Industrial research institute, Japan. Preparation of reclaimed rubber with soy-bean oil.....685	Over-population problem, relation to soybean flour..1178
Osborne, T. B. (cited).....611	
Continuation and extension of work on vegetable proteins. With L. B. Mendel.....1326	P., C.: Soybeans in the United States and Manchoukuo.....411
Food value of soy bean products. With L. B. Mendel.....1327	Pacific northwest chemurgic conference. Proceedings... 1937.....539
Use of soy bean as food. With L. B. Mendel.....1328	Pailieux, A.: Le potager d'un curieux. With D. Bois..16
Osgood, G. H.: Vegetable protein-base glue (patent).....1554	Paint and varnish manufacturers association of the United States, Educational bureau.....668
Oshima, Kintaro: Digest of Japanese investigations on the nutrition of man.....1329	Paint and varnish manufacturers association of the United States, Educational Bureau, Scientific section. Changes in oil upon storage.....668
	Legitimization of soya bean oil.....668
	Soya oil in paints.....668

<u>Item</u>	<u>Item</u>
Paint manufacturers association of the United States.....688	Palladin, N. V.: Die gewinnung von technischen soja-eiweiss ("Rusein") und seine verwendung zur leimherstellung. With L. A. Sitin.....604
Paint manufacturers association of the United States, Educational Bureau.	Palm kernel cake and meal, compared with soybean oilcake, feeding experiments.....885
Repainting tests on paint oils.....671	Palm nuts, extraction, apparatus and process, patent.....1585
work done in the interest of soybean oil.....697	Palm products, demand, diminished by home-production of oil-producing crops.....82
Paint manufacturers association of the United States, Educational bureau, Scientific section.	Paris. Académie des sciences. Le soja dans l'alimentation française.....1175
Committee work on hexabromide test for determining purity of soya bean oil or linseed oil, Steele or Bailey method.....664	Park, J. B. Corn and soybean combination. With H. L. Borst.....744
Driers for soya oil.....665	Experiments with growing corn and soybeans in combination. With H. L. Borst.....745
Examination of commercial American soya bean oil..666	Growing soybeans in corn. With C. J. Willard and H. L. Borst.....818
Hexabromide test for determining purity of linseed oil.....632	Harvesting soybeans for hay. With C. J. Willard and L. E. Thatcher.....389
Inspection report on Washington paint oil tests and Washington cement paint tests.....701	Harvesting soybeans for seed.....373
Legitimization of soya bean oil.....667	Protein content of soybean hay. With L. E. Thatcher.....940
Production and use of soya bean oil in the United States with a brief history of their development.....696	Soybean.....819
Repainting tests on paint oils.....671	Soybeans as human food.....296
Soya bean and soya oil.....697	Soybeans for human food....1331
<u>See also</u> Institute of paint and varnish research.	Soybeans: their culture and uses. With C. G. Williams.....296
Paint and varnish manufacturers association of the United States	Uses of soybeans.....296
Paint tests, Washington, D. C...670, 671	Varieties of soybeans for Ohio.. .....820
Palen, L. S.: Romance of the soya bean.....188	Parker, E. C.: Importance of oil and protein content in evaluating soybeans.....441



<u>Item</u>	<u>Item</u>
Parsons, H. T.....952	Peanuts - Continued
Parsons, T. R. (quoted).....1367	food value - continued
Use of soy bean in human	compared with tomato
nutrition.....1332	seed and soybean
Use of the soy bean in human	proteins as supple-
nutrition.....1178	ment to corn
Pate, W. F.: Soybean harvesters..374,	proteins.....1272
375	outlook charts.....466-468
Paul, M. S.: Nutritive value of	powdered, extraction,
peanut and soy bean flours	apparatus and process,
as supplements to wheat	patent.....1585
flour. With C. O. Johns	Spanish
and A. J. Finks.....1269	cultivating and seeding,
Peanut cakes, ground, fed to	costs per acre.....1052
hogs, effect upon deposition	fed to hogs, as corn
of nitrogenium.....1099	supplement, Georgia..1052
Peanut flour	versus soybeans.....565
food value.....1239	Pearce, J. M.: Future of the
mixed with soybean flour,	soybean industry.....189
supplement to wheat-flour	Pearson, P. B.: Relation of
proteins.....1272	protein to hemoglobin
protein content, well	building. With C. A.
digested and of high	Elvehjem and E. B. Hart....1333
biological value.....1239	Peiping union medical college,
supplement to wheat flour....1269	Peiping.....1334
Peanut hay	Peiping union medical college,
compared with soybean hay.....972	Peiping. Department of
fed dairy cows.....970-971	biochemistry.....1402-1403
considerable saving over	Peiping union medical college,
soybean hay.....971	Peiping. Department of
prices, one-third less than	medicine.....1247
soybean hay.....971	Peiping union medical college,
Peanut meal, for dairy	Peiping. Department of
cows.....977,984	medicine, Division of
Peanut milk, patent.....1529	pediatrics.....1384,1386-1389
Peanuts	Pellagra-preventive action,
casein	of dried beans, casein,
extraction.....573	dried milk, and brewers'
preparation for glue and	yeast.....1228
plastics.....573	Pelton, W. C.: Hahto soy bean
digestibility	as a lima substitute.....190
coefficient.....1334	Pennsylvania...53,133,182-183,209,
steam cooked.....1241	269,455,548,815,957,1133
fed hogs as protein supple-	Pennsylvania. Agricultural
ment, to corn.....1055	experiment station.
food value.....1334,1361	Soybean hay for milk
as compared with other	production.....957
legumes.....1241	Soy beans.....455
	Soybeans for
	Pennsylvania.....815

<u>Item</u>	<u>Item</u>
Pennsylvania railroad, exhibition on soybean.....4e,548	Philippine Islands....324,508,609, 1170,1201,1325,1399
Pennsylvania state college, School of agriculture, soybean feeding experiments with turkeys.....1133	Philippine Islands medical association. Effect on leprosy of certain oils not in the chaulmoogra group.....1399
Pennsylvania State college, School of agriculture, Extension division. Soybeans.....209	Greater significance of soy bean in the Filipino dietary.....1201
Soybeans in Pennsylvania....53	Philips, J. G. Feeding soy bean oil meal to laying pullets.....1138
Peroverzeva, T. V.: Methoden der feuchtigkeitsbestimmung in sojabohnen. With A. N. Lebedev.....431	Meat scraps versus soybean proteins as a supplement to corn for growing chicks. With R. H. Carr and D. C. Kennard.....1139
Perilla oil fire hazard, same as linseed oil.....676	Soy bean oil meal in rations for laying pullets. With S. M. Hauge.....1140
use in paint industry.....686-687	Phillips, C. O.: Food product [from soybean meal] (patent).....1556
See also Oils and fats; names of oils	Phillips, J. B.: Utilization of the soya bean.....540
Perkins, A. E. Soybean hay and soybean silage. With C. C. Hayden.....897,976	Phillips, P. H.: Soybean oil prevents one type of chick paralysis. With A. I. Coombes, C. A. Elvehjem, and E. B. Hart.....1128
Soybeans and soybean oilmeal for milk production. With C. C. Hayden.....977	Phillips, T. D.: Soybeans in rotation.....321
Soybeans or meal for cows....1003	Phytopathological society, Japan. Soy bean cake as a substitute for peptone in the preparation of the nutrient media.....585
Perov, S. S.: Complex method of industrial utilization of the soybean.....536	Pian, Jina Hsueh-chin: Biological value of the proteins of mung bean, peanut, and bean curd.....1334
Perrot, J. B. F.: Transparent, flexible, non-inflammable plas- tic material [from soy beans] capable of replacing celluloid, suitable for finishing, spinning and weaving. With P. J. Contant (patent).....1451	Piatt County, Ill.....14,69,379
"Pharmagans" Pharmaceutisches Institut Ludwig Wilhelm Gans A. G. Improved manufacture of phosphatides [from soya beans, etc.] (patent).....1555	Piatt County Cooperative soy bean company, Monticello, Ill.....69
Phelps, C. S.: Soy bean as a forage and seed crop.....821	
Philippine bureau of science. Soy beans as a component of a balanced diet and how to prepare them.....1325	



<u>Item</u>	<u>Item</u>
Pickat, A. K.: Nutrient value of edible fats and oils. With N. S. Zenin, P. I. Alekseeva, and O. Kurtsina.....1335	Popel, L. W.: Verdauung und resorption von gerichten aus sojabohnen im menschlichen organismus. With E. S. London, N. I. Schochor, A. G. Gagina, A. I. Kolotilowa, R. M. Kutok, and E. A. Markarjan 1303
Piedmont section of Georgia.....279	Popova, N. N. Bacterial method of obtaining "to-fu." With D. E. Belenky.....536
Piedmont section of North Carolina.....299	[Cheese from soy-milk.] With D. E. Belenky (patent).....1417
Pillsbury, L. K.: Food-flavoring material containing soybean products. With A. A. Levinson (patent).....1510	Koumyss from soybean milk. With D. E. Belenky.....536
Piper, C. V. Hay. With others.....191	Pork production cost.....1060
Soybean. With W. J. Morse....192	cheap, with soybeans..867
Soy bean; history, varieties, and field studies. With W. J. Morse.....193	and corn.....1035,1079
Soy bean; with special reference to its utilization for oil, cake and other products. With W. J. Morse.....194	Louisiana.....314
Soy beans. With H. T. Nielsen.....822	Illinois.....1046
Pittman, Lawrence: Handling soybeans.....412	with grain, Delaware....1064
Plastics <u>See</u> Soybean plastics	with soybean oilmeal, more economical than with wheat middlings.....1070
Pohlman, G. G.: Some factors affecting the influence of soybeans, oats, and other crops on the succeeding crop. With D. R. Dodd.....767	with soybeans.....1036
Poland.....1130	cost.....1071
Pollak, J.: Soy bean is a source of food and milk for diabetics.....1336	quality effect of soybeans on...1115
Pontius, A. W.: Soap from soya beans.....702	effect of soybeans and soybean oilmeal upon.....1080,1114
Pope, C. J. Process of making soy milk. With L. J. Monahan (patent).....1533	firmness, modified by feed and other factors.....1062
Soy-milk product and process of making the same. With L. J. Monahan (patent)....1534	soft caused by feeding soybeans....1047,1062, 1089,1094, 1097,1102
Pope, F. T. Soy bean growing in importance.....195	difficulty of marketing...1050
World trade in soy beans.....457	danger of, from feeding soybean oil meal...655

Item

Item

Pork - Continued

quality - continued  
 soft - continued  
     financial loss to  
         farmers.....1097  
     from market standpoint 1102  
     increase in quantity,  
         Swift and co.,  
         plants.....1102  
     studies in Corn Belt,  
         rightly centered  
         around soybeans.....1116  
 unsatisfactory to packer  
     and consumer produced,  
     unless restrictions placed  
     on feeding of soybeans....1113  
 value, produced on one acre  
     of soybean forage,  
     Delaware.....1064

See also Bacon; Meat

Portsmouth, Va., soybean  
     processing plant.....229  
 Post, A. H.: Soybeans.....196  
 Potash lye, manufacture from  
     soybean potash.....621  
 Potatoes, dried, in hog  
     feeding.....1073

Poultry

fed

ground soybeans.....1147-1148  
 soybean meal  
     compared with meat and  
         bone meal.....1130  
     experiments.....1129  
     with separated milk  
         and minerals.....1141  
 soybean oil.....1126  
     preventive for  
         encephalomalacia...1126,  
                                     1128  
 soybean oilcake.....1144  
     and kaoliang.....1143  
     with chlorine.....1145  
 soybean oilmeal.....929,1134,  
                                     1136,1140,1149  
     as substitute for  
         tankage.....1135  
     effect on hatchability  
         and egg production.1127  
     experiments, Wisconsin  
         University.....868

Poultry - Continued

fed - continued

soybean oilmeal - continued  
     prepared at different  
         temperatures.....1131  
     rations, suggested  
         for use with.....1142  
     with mineral salts...1138  
 soybeans.....4a,155,887,  
                                     905,919,922  
     as supplement to  
         corn.....1139  
     sprouted.....1132  
     vegetable protein.....1137

See also Turkeys

Pozzi-Escot, Emm.: Chimie de  
     l'industrie du soja.....1337  
 Prakhin, M.: Utilization and  
     rationalization in the  
     obtaining of "to-in".....536  
 Prentice, J. H.: Role of  
     separated milk, soya bean meal  
     and minerals in the nutri-  
     tion of the chick. With  
     R. G. Baskett.....1141  
 Prevo, A. A.: Soybean oil-cake  
     in poultry raising.....536  
 Price, D. J.

Dust explosion prevention in  
     soybean processing  
     plants...4d  
 Explosions reveal hazards  
     of soybean plant  
     explosion. With H. R.  
     Brown.....703  
 Glidden soybean plant  
     explosion. With  
     H. R. Brown...703  
 Rural soybean plant  
     explosion.....704  
 Soy bean explosion  
     hazards.....705

Price, J. N.: Home-grown  
     rations in economical  
     production of milk and  
     butter.....1004  
 Pridmore, J. C.: Soy beans,... 197  
 Prince, F. S.: Soy bean in  
     New Hampshire.....198



<u>Item</u>	<u>Item</u>
Prinsen Geerligs, H. C. <u>See</u>	Puerto Rico.....1199,1370
Geerligs, H. C. P.	Puerto Rico. Agricultural
Prinz, H.	experiment station.....1370
Die bedeutung des Berczeller'schen	Cooking qualities of
sojamehles für	soybeans.....1199
Grossbritannien.....1178b	Puerto Rico. University.
Zur rationalisierung der	College of agriculture and
volksernährung durch die	mechanic arts, Extension
sojabohne.....1338	service, Office of home
Proscio oils corp. Apparatus and	demonstration work, tests
countercurrent solvent system	on cooking qualities
for extraction of oils and	of soybeans.....1199
fats from cacao-cake powder,	Purdue research foundation,
soy bean flakes or other	West Lafayette, Ind.....1500
materials (patent).....1557	Purdue University
Proteids <u>See</u> Protein	Feeding soy bean oil meal
Protein	to laying pullets.....1138
assimilation in poultry,	soybean hog feeding trials 1117
effect of soybean oilmeal	Purdue University. Agricultural
on.....1136	experiment station <u>See</u>
composition, process, patent 1572	Indiana. Agricultural
effect on rate of hemoglobin	experiment station,
regeneration in nutritional	Lafayette
anemia in rats and	Purdue University. Department
mice.....1333	of agricultural extension,
for supplement feed, shortage	Divisions of agronomy,
impending, cause of growth	dairy husbandry, animal
of soybean industry.....185	husbandry, and poultry
problem, solved by soybeans,	husbandry. Feeding
Corn Belt.....874	soybeans and soybean
products, improvement,	oilmeal on Indiana
process, patent.....1425	farms.....922
quality, measurement, possible,	Purdue University. School of
with sheep and nitrogen	agriculture, soybean feeding
balance type of experi-	trials with dairy
mentation.....1162	cattle.....1029
soluble, patent.....1551	Purdue University, School of
utilization for milk pro-	agriculture, Extension
duction, methods of	service.
determination.....984	Costs and profits in pro-
vegetable	ducing soybeans in
substances, manufacture,	north central
process, patent.....1570,	Indiana, crop of
1571,1574	1923.....329
utilization	Feeding soybeans and
in lacquer manufacture,	soybean oilmeal on
patent.....1568	Indiana farms.....922
in poultry feeding.....1137	Soybeans for Indiana
<u>See also</u> Soybeans; protein	farms.....10

<u>Item</u>	<u>Item</u>
Pyuria	Rats, feeding experiments - Cont'd
in infants	with soybean products.....1327
treatment with soybean	with soy-bean wheat
diet and alternate	bread.....1268
treatment.....1308	with soybeans.....1328
treatment with soybean	and soybean oilmeal.....1101
oilmeal.....1307	with yeast and casein
Quebec. Dept. of agricultur .	supplements, in corn
Soy beans as food.....1340	and soybean rations.....1100
Rabbits, blood	Rauchenstein, Emil: Cost of
calcium, lowered, restored	producing field crops in
by raw cooked soybeans....1257	three areas of Illinois,
changes, effect of soybeans	1913-1922. With R. C.
on.....1246,1384	Ross.....322
lipase, effect of soybean	Reece, F. M.: Ungelled drying
feeding on.....1247	oil product suitable for
sugar, affected by sub-	varnishes, etc. With M. F.
cutaneous injections of	Taggart (patent).....1558
taka-diastase.....1248	Rees, T. W.
Ralston purina company, St.	Improved process of, and
Louis, Mo. Soybeans for	apparatus for, treating
beginners.....199	soya beans (patent).....1559
Rape	New or improved process for
fed, hogs.....1077	treating soy beans
supplement to corn	(patent).....1560
compared with soy-	Reid, Eric
beans.....1106	Calcium, phosphorus, and
Corn Belt.....1105	nitrogen retention of
Rapeseed oil, interchange with	rats on soybean-egg
domestic corn and soybean	powder and whole milk
oils, economic factors	powder diets.....1341
affecting.....733	Nutritive properties of
Rats, feeding experi-	soybean-egg-powder, a
ments.....1101,1205,1324	substitute for cow's
with cow's milk, made	milk in infant
anemic.....1166	dietary.....1342
with soybean egg powder,	Preliminary report on the
calcium and nitrogen	preparation of an
retention.....1341	infant food, a soybean
with soybean meal.....1180	milk-egg powder.....1343
with soybean milk.....1385	Remington, R. E.: Vitamin G
and cow's milk.....1164	content of some foods.
with soybean oilmeal.....1234	With Harold Levine.....1299
Wisconsin university....868	Remy, E.: Uber sojabohnen-
	milch.....1344



<u>Item</u>	<u>Item</u>
Renner, H. O.	Reynoldson, L. A.
Method for improving and removing the odor and/or flavor of legumes. With L. W. Haas (patent)...1485	Harvesting small grain, soybeans, and clover in the corn belt with combines and binders. With W. R. Humphries and J. H. Martin.....376
Method of reducing oil content of soya. With L. W. Haas (patent).....1486	Harvesting soy beans.....377
Revis, Cecil: Fatty foods. With E. R. Bolton.....501	Rhoad, A. O.: Valor da soja molda para producao de leite. With G. G. Carneiro.....1345
Rewald, B. A.	Rhode Island.....2,1126
Improvements in and relating to the manufacture of aqueous emulsions con- taining lecithin [from soya bean]. With Hermann Bollmann (patent) 1429	Rhode Island. Agricultural experiment station Annual report, 1902- 1903.....2
Improvement in and relating to the production of thickening materials for use in printing [from soya beans]. With Hermann Bollmann (patent).....1430	Soy bean.....2
Light-coloured mixture of vegetable phosphatides and fatty oil [made with soybean lecithin] (patent).....1561	Rhode Island. State board of health. Soy bean - a little known legume.....1186
Method of preparing stable aqueous emulsions of lecithin and oil (patent).....1562	Rice
Phosphatides as commercial products.....606	outlook charts.....467,468
Produit d'apprêt, d'encollage et d'adoucisement. With Hermann Bollmann (patent).....1435	rotated with soybeans, Louisiana.....758,794
Reynolds, E. B.....47,102	Richards, Gwynne: Food product and process of making the same [from soybean mash]. (patent).....1563
Reynolds, J. B.: Studies in the drying oils. XVIII. Specific heat and features of heating drying oils. With J. S. Long and Joseph Napravnik.....692	Richards, W. B.: Value of soy beans as a part of a grain ration for lambs. With Frank Kleinheinz.....1160
Reynolds, William: Soybeans on a stock-farm.....824	Richardson, J. W.: La soja y el conflicto sino- japonés.....200
	Richert, T. G.: Oils, their production and consumption..201
	Richey, P. S.: Soybeans for cornbelt stock-farms.....923
	Richter, K.
	Die einwirkung der verfütterung von holzzuckerhefe im vergleich zu sojaextrak- tionsschrot auf menge und fettgehalt der milch von kühlen. With J. Herbst.....1005

Item

Item

Richter, K. - Continued  
 Der wert der sojabohne als  
 futtermittel. With  
 A. Scheunert.....927  
 Richter, V. F. A.  
 Das Berczeller'sche sojamehl  
 von bäckereitechnischen  
 standpunkt.....1178  
 Dr. Berczeller's soya flour  
 in the Vienna and con-  
 tinental bakery.....1178b  
 Technology of breadmaking  
 and the Dr. Berczeller's  
 new soylour.....1178b  
 White bread versus brown  
 bread or the bread of  
 tomorrow.....1178a  
 Rickets, experimental studies...1266  
 Rickey, L. F.: Processing  
 soybeans.....607  
 Riedel, J. D.  
 Extraction of phosphatides  
 from the soya bean  
 (patent).....1564  
 Verfahren zur aufarbeitung  
 von abfallprodukten der  
 sojabohnen-Ülgewinnung  
 (patent).....1565  
 Riegel, W. E.....83,287,776  
 crop rotation system.....836  
 National crisis facing  
 soybean growers in  
 the United States.....4c  
 Protecting the American  
 soybean market.....4d  
 Small grains after soybeans.....4  
 Some soy bean suggestions.....825  
 Twenty years with soybeans.  
 Conclusions derived from  
 experience on Meharry  
 Farms. With C. L. Meharry,  
 W. J. Withrow, E. N.  
 Stafford, and J. M.  
 Crumbaker.....4a  
 Rimini, Enrico: Il pane e le  
 paste alimentari pei  
 diabetici.....1346

Rindl, M.: Soy bean.....202  
 Rippey, H. F.  
 Cellulose-fiber product  
 treated with a size  
 embodying soy-bean flour  
 and process of making  
 the same With Glenn  
 Davidson, C. W. Cone,  
 I. F. Laucks, and H. P.  
 Banks. (patent).....1456  
 Plastic composition and  
 method of making same.  
 With I. F. Laucks,  
 H. P. Banks, Glenn  
 Davidson, and C. N.  
 Cone (patent).....1504  
 Ristow, C. S.....774  
 Rittinger, F. R.: Soy bean  
 (vegetable) milk in infant  
 feeding. With L. H.  
 Dembo.....1347  
 Robbins, F. E.: Growing soybeans  
 to meet grading  
 standards.....4c  
 Robbins, R. C.: Nutritive  
 value of green immature  
 soybeans. With C. D.  
 Miller.....1310  
 Robert, J. C.: Preliminary  
 report on the economic  
 value of the soybean.....203  
 Roberts, George: Soybeans.  
 With E. J. Kinney.....792  
 Roberts, L. J.: Cheap homemade  
 soy-bean meal for  
 diabetics. With E. W.  
 Miller.....1348  
 Robertson, D. W.: Soybeans  
 under irrigation in  
 Colorado. With Alvin  
 Kezer and G. W. Deming.....204  
 Robinson, C. H.: Digestibility  
 of Canadian feeding stuffs -  
 soybean oil meal. With  
 C. J. Watson, J. C. Woodward,  
 W. M. Davidson and G. W.  
 Muir.....944



<u>Item</u>	<u>Item</u>
Robinson, L. E.....47	Rose, M. S.
Robinson, Paul: Resin; coating composition. With J. W. Iliff (patent).....1492	Maintenance values for the proteins of milk, bread- and-milk, meat, and soy bean curd in human nutrition. With Grace MacLeod and Bertha Bisbey.....1349
Robison, W. L.....1106	Maintenance values for the proteins of milk, meat, bread and milk, and soy bean curd. With Grace MacLeod.....1350
Comparison of soybean oil- meals for supplementing corn for hogs.....1084	Rosenbaum Grain corporation, data on soybeans.....114
Cooking soybeans for hogs....1085	Rosenberger, E. T.: Soy bean milk as a food.....1351
"Hogging" soybeans and corn.....1086	Rosengren, L. F.: Einfluss der sojakuchen auf die beschaffenheit der butter..1006
Influence of the method of oil extraction on the feeding value of soybean oilmeals.....924	Ross, Gladys: Introducing Mrs. Soy bean.....1352
Soybean oilmeal as a feed for swine.....1087	Ross, R. C.
Soybean oilmeal as a protein.....1088	Changes in costs and practices in the production of soybeans.....4e
Soybean, soybean oilmeal, and soft pork.....1089	Cost of producing field crops in three areas of Illinois, 1913-1922. With Emil Rauchenstein.....322
Soybeans and soybean oilmeal as supplements to corn for hogs.....1090	Costs of growing and harvesting soybeans in Illinois.....4b
Soybeans and soybean oilmeal for pigs.....4c,1091,1092	Soybean costs and pro- duction practices.....327
Soybeans for feeding hogs....1093	Roszony.....1216
Soy beans for hogs.....1094	Rothéa, F.: La lécithine végétale de soja. With F. Nielloux.....608
Soybeans in corn for hogging down.....1095	Rouest, L.: Le soja et son lait végétal.....543
Supplements to corn for fattening swine.....1096	Rowe, C. A.: Pigs+corn+soybeans+ clover = ?.....1098
Rogers, L. M.: Study of the blacktongue preventive action of 16 foodstuffs. With Joseph Goldberger, G. A. Wheeler, and R. D. Lillie....1227	Royal Lancashire agricultural society. Some new feeding stuffs and their relative value as cattle foods.....1015
Rokusyo, Bunzo: Seasoning material (patent).....1566	
Roquemore, E. E.	
Feeding whole soybeans causes soft pork.....1097	
Soy flour.....539	
Soybean oil meal high protein feed.....925	
Soybean oil meal rating as a protein supplement....708	

Item

Item

Royal society of arts.  
 Utilisation of cereal offals  
 and certain other products  
 for feeding purposes.....892  
 Rozul, J. B.: Cost of production  
 of soy bean (glycine  
 hispida).....324  
 Ruata, Guido: La soia nell'ali-  
 mentazione italiana. With  
 Giuseppe Testoni.....1353  
 Rubber  
 cold-vulcanized, soybean  
 oil as plasticizing  
 agent of.....651  
 elongation, increased by  
 use of soybean oil.....651  
 powder, raw, prepared with  
 soybean lecithin inferior  
 to those manufactured from  
 standard raw rubber.....601  
 reclaimed, preparation with  
 soybean oil.....685  
 Ruffner, R. H.: Soy bean hay  
 versus alfalfa hay for  
 winter maintenance of  
 sheep.....1161  
 Ruhrh, John  
 Further observations on the  
 soy bean.....1354  
 Soy bean and condensed  
 milk in infant feeding....1355  
 Soy bean as an article of  
 diet for infants.....1356  
 Use of the soy bean as a  
 food in diabetes. With  
 Julius Friedenwald.....1222  
 Rupel, I. W.....1032  
 Rusk, E. W.  
 Beans protect corn from  
 chinch bugs.....826  
 Soy beans.....205  
 Soy beans as grown in  
 Adams.....827  
 Rusk, H. P.  
 Rapid increase in soybean  
 acreage brings problem  
 of utilization.....904

Rusk, H. P. - Continued  
 Soybeans for beef-cattle  
 feeding.....4b  
 "Toasting" soybean oil  
 meal lowers  
 palatability. With  
 R. R. Snapp.....1007  
 Russell, E. Z.: Soybeans as  
 related to pork production  
 in the United States.....4  
 Ruth, J. P.: Process of  
 making casein from soybean  
 meal. With D. N.  
 Burruss, Jr. (patent).....1445  
 Rye  
 feed value for hogs.....1077  
 New Jersey.....181  
 Rye flour proteins, supplement  
 soybean flour proteins.....1287  
 Rye straw, New Jersey.....181, 317  
 Rye-wheat  
 bread, utilization, better  
 than soybean bread.....1320  
 flour, mixed with soybean  
 flour, in breadmaking,  
 metabolism experiments  
 on human subjects.....1320  
 .....  
 Sahashi, Yoshikazu  
 Further evidence for the  
 occurrence of vitamin E  
 in soy bean oil. With  
 Umetaro Suzuki and Waro  
 Nakahara.....1379  
 Occurrence of vitamin E  
 in soy bean oil.  
 With Umetaro Suzuki  
 and Waro Nakahara.....1380  
 Sahr, C. A.: Report of the  
 Assistant agronomist.  
 [Hawaii] Experiments with  
 leguminous plants.....206  
 "Saké" oil, nature of.....1214  
 Salazar, L. G.: Manufacture  
 and chemical control of  
 some soybean products  
 under Los Baños  
 conditions.....609



<u>Item</u>	<u>Item</u>
Sale, F. K.....336	Satow, Sadakichi - Continued
Samim, Vasfi: Zur kenntnis der einwirkung verschiedenartig entfetteter sojaschrote auf das blutbild des rindes.....1008	Proteidal composition and process of making the same (patent).....1572
Sandburs, replaced by soybeans...127	Proteins of sojabean and their industrial applications.....612
Santos, D. S.: Physical characteristics and chemical composition of various brands of toyo (soy sauce) sold in the Philippines. With F. T. Adriano, S. B. Oliveros, and E. R. Villanueva.....1170	Researches on oil and proteids extraction from soy-bean.....208
Sato, Masanori Method of extracting fatty oil [from soya bean]. With Chiyomatsu Ito (patent).....1567	Sauce and process of making the same [from soya beans] (patent).....1573
On the preparation of fuel oil by distillation of the lime soap of soya bean oil. With K. F. Tseng.....610	Vegetable proteid product and process of making the same (patent).....1574
Preparation of a liquid fuel resembling petroleum by the distillation of the calcium-salt of soya-bean fatty acids.....610	Satow, Teikichi: Apparatus for treating soy beans (patent).....1575
Satow.....1214	Sauer, Arthur Method of producing albumin from Japanese soja (patent).....1576
Satow, S.....679	Process for preparing a rubber substitute from soya-bean oil. With Fritz Gössel (patent)...1480
Satow, Sadakichi	Savage.....1032
Lacquer and process of making the same (patent).....1568	Schaeffer, O. G. Soybeans and soybean hay in the dairy ration.....1009
Linoleum-like substance and process of making the same (patent).....1569	Soybeans cut feed cost.....1010
Manufacture of plastic products from proteid of soy bean.....611	Scheffbeck, Willi: Über sojabohnenvergiftung und vergiftung mit chlorkohlenstoffen.....926
Process of manufacturing vegetable proteid sub- stances (patent).....1570	Schellong, Fritz Bread [from soybean flour...] (patent).....1577
Process of manufacturing vegetable protein sub- stances [from the soybean or other proteid containing substances]. (patent).....1571	Über ein neues "soja-wasserbrot" und die verwendung des sojamehles in der behandlung der zucker- krankheit und der fettsucht.....1358
	Scherer, Robert: Casein.....613

Item

Item

Scheunert, Arthur

Über den vitaminingehalt der  
bei der margarine  
fabrikation verwendeten  
technischen soja-  
phosphatidpräparate.....1359

Über den vitaminingehalt  
frischer sojabohnen.  
With M. Schiebllich.....442

Der wert der sojabohne als  
futtermittel. With  
K. Richter.....927

Schieber, W.: Die sojabohne und  
deren volkswirtschaftliche  
bedeutung als nahrungs-  
mittel.....1360

Schiebllich, M.: Über den  
vitaminingehalt frischer  
sojabohnen. With A.  
Scheunert.....442

Schleinitz, Frein v.: Versuche  
über den stickstoffansatz  
von wachsenden schweinen bei  
fütterung mit trockenhefe,  
sojaschrot und erdnusskuchenmehl.  
With J. Schmidt and E.  
Lagneau.....1099

Schmidt, J.: Versuche über den  
stickstoffansatz von  
wachsenden schweinen bei  
fütterung mit trockenhefe,  
sojaschrot und erdnusskuchenmehl.  
With Frein v. Schleinitz  
and E. Lagneau.....1099

Schmitz, Nickolas  
Soybeans.....209,828  
Soybeans in the Eastern  
States.....4

Schochor, N. I.: Verdauung und  
resorption von gerichten aus  
sojabohnen im menschlichen  
organismus. With E. S.  
London, A. G. Gagina, A. I.  
Kolotilowa, R. M. Kutok,  
E. A. Markarjan, and L. W.  
Popel.....1303

Schönfeld.....1243

Schou, E. V.

Improvements in or relating  
to oleaginous emulsifying  
materials, and to the  
manufacture of edible  
substances (patent).....1578

Improvements in or relating  
to the manufacture of  
emulsions or emulsifying  
ingredients or  
materials (patent).....1579

Schubert, C. E.: Investigation  
of the suitability of soy  
bean oil for core oil.  
With C. H. Casberg.....642

Schultz, A. S.: Effect of active  
soybean on vitamin A. With  
C. N. Frey and R. F.  
Light.....1221

Schwarz, Robert: Assimilable  
protein decomposition  
products from soybeans,  
etc. With Stephen  
Laufer (patent).....1580

Sconce, H. J.: Soy bean  
conquers industrial  
America.....210

Scotland.....959

Sears, O. H.  
Soybean production in  
Illinois. With J. C.  
Hackleman and W. L.  
Burlison.....86

What we know about the  
fertility value of  
soybeans.....4e

Seeds  
agricultural, definition,  
includes soybean seed....399  
field

commercial, requirements,  
sales, and stocks.....473  
prices, wholesale.....462  
law rules, Connecticut.....399  
supply.....184

See also names of kinds  
of seeds as Soybeans



<u>Item</u>	<u>Item</u>
Sefing, F. G.: Use of soy bean oil as a core binder. With M. F. Surls.....709	Shellabarger, W. L. Manufacturing of soya bean flour (patent).....1581
Semple, A. T.: Feeding soybeans.....928	Procédé de fabrication de farine de soja (patent).....1581
Setnitskii, N. A.: Soya beans on the world market.....413	Process of manufacturing soy bean flour (patent).....1581
Seulke, K. J. Formula changes and why.....929 Why soybean oil meal?.....1011	Shellabarger grain products co., Decatur, Ill.....1581 Soybean meal.....1582
Sewell, W. E.: Soybean hay as a supplement to white corn and tankage for growing and fattening hogs. With J. C. Grimes and W. C. Taylor.....1061	Shemiakin, F. M.: Claytonisation of soybean seeds. With M. S. Dunin and A. M. Symiski.....435
Shantung Christian university, studies on soy bean products.....1167	Shen, Tze-Hui: Preparation of emulsion paints from soybean casein. With Wei Sun.....614
Shaw, Norman: Soya bean of Manchuria.....211	Shiba, Tokitaka: On the nutritive value of the proteins of soy bean and pea nut. With Manshi Koyama.....1361
Shaw, R. H.: Study of ensiling a mixture of Sudan grass with a legume. With P. A. Wright.....954	Shimo, Kotaro: Fermentation of soybean meal. With Taro Harada.....710
Shaw, Wilfred: Commercial prospects with soybeans.....4a	Shimomura, Tsuneo: Study on polymerised soja bean oil and its soap. With Masawa Hirose.....678
Sheep fed soybean hay.....917,1152 versus alfalfa hay.....1161 soybean meal.....1158 soybean oilcake compared with other feeds.....885 soybean oilmeal.....917,1152 compared with linseed meal and corn-gluten meal.....1162 soybean silage.....1157 soybean straw.....1152 soybeans..887,905,917,922,1152 as corn supplement, weight and wool increase.....1154 feeding experiments.....1162 <u>See also</u> Lambs; Livestock	Shirahana, Kiyoshi: Influence of soy bean cake upon milk production and the quality of butter. With Eiji Takahashi, Kenzo Iguchi, and Kentaro Mitamura.....1022 Shishido, T.....437 Shive, J. W.: Influence of calcium and nitrogen on the protein content of the soybean plant. With J. M. Ginsburg.....426

Item

Item

Shoptaw, L. N.  
 Gastric digestion of soybean flour. With D. L. Espe and C. Y. Cannon.....1012  
 Gastric digestion of soybean flour when used as a substitute for cows' milk in feeding dairy calves.....1013  
 Soybean flour as a substitute for cow's milk in feeding dairy calves.....1014  
 Short, J. R., milling co., Chicago, Ill.....1485,1486,1606  
 Shoyu See Soy sauce  
 Shrewsbury, C. L.  
 Cystine deficiency of soybean protein at various levels, in a purified ration and as a supplement to corn. With J. W. Bratzler.....930  
 Effect of soybeans, soybean oil meal, and tankage on the quality of pork. With C. M. Vestal.....1113  
 Effect of yeast and casein supplements to corn and soybean rations when fed to rats and swine. With C. M. Vestal and S. M. Hauge.....1100  
 Effects of soybeans and soybean products on pork quality. With C. M. Vestal.....1114  
 Improvement of nutritive properties of soybeans brought about by heating. With E. B. Johnson.....493  
 Nutritive value and mineral deficiencies of soybeans. With C. M. Vestal.....1101  
 Nutritive value of soybeans with preliminary observations on the quality of pork produced. With C. M. Vestal.....1115

Siddall, A. C.: Feeding experiment with soybean milk. With Y. T. Chiu.....1362  
 Silage  
 and cracked soybeans, fed to dairy cows, effect on production.....1031  
 efficiency in preserving feed nutrients in legume roughage.....918  
 value, dependent upon dry weight.....947  
 . See also names of kinds of silage as Soybean silage  
 Simpson, F. M.: Soft pork from the market standpoint.....1102  
 Simpson, W. F.: Economic study of methods of harvesting soybeans for seed.....378  
 Sinclair, J. F.: Recent observations in the use of soy bean in infant feeding.....1363  
 Sino-Japanese conflict, and soybean.....200  
 Sitin, L. A.: Die gewinnung von technischem sojaeiweiss ("Rasein") und seine verwendung zur leimherstellung. With N. V. Palladin.....604  
 Sizing composition, patent....1452  
 Skinner, J. H.  
 Soy beans, middlings and tankage, as supplemental feeds in pork production.....1103  
 Supplements to corn for fattening hogs in dry lot. With W. A. Cochel.....1104  
 Slate, W. L., Jr.  
 Corn and soybeans as a combination crop for silage. With B. A. Brown.....931  
 Soy beans in Connecticut. With B. A. Brown.....22



<u>Item</u>	<u>Item</u>
Slawson, H. H. : Agriculture's Jack of all trades.....544	Smith, R. A.: Soybean test compares hogging-down vs. dry lot. With W. E. Carroll, Sleeter Bull, and J. H. Longwell.....1042
Baby's milk from beans.....1364	Smith, R. L. Isolation of sucrose from soybeans. With H. R. Kraybill and E. D. Walter.....592
Slipher, J. A.: Soybean and soil improvement.....829	Soy-bean oil. With H. R. Kraybill.....711
Sloan, H. J.: Soybeans for poultry.....904, 1142	Smith, W. C. Soy bean in the corn belt..1105
Sloat, H. W.: Process of producing synthetic nuts [from legumes, esp. soybeans]. (patent).....1583	Soy beans with corn.....831
Sloat, H. W., co., Los Angeles, Calif.....1583	Smith, W. G. Soybean - a crop for emergencies.....216
Slosson, E. E. Catching up with China.....1365	Soy bean: (a) its uses; (b) the action of its enzyme, urease, upon urea.....546
Soy.....1366	Smith, Watt: Nutritive protein of some newly developed soy beans. With A. A. O'Kelly and R. C. Wilson, Jr.....1324
Smallwood, H. St. C.: Romance of the soya bean.....212	Smoot-Hawley Tariff hearings, soybean oil.....144
Smetham, Alfred: Some new feeding stuffs and their relative value as cattle foods.....1015	Smuts, D. B.: Amino acid deficiencies of beef, wheat, corn, oats and soy beans for growth in the white rat. With H. H. Mitchell.....1311
Smith, A. G. New grist for the oil mills...213	Snapp, R. R. Soybeans and soybean products for beef cattle and sheep.....4e
Soy beans in systems of farming in the cotton belt.....214	"Toasting" soybean oil meal lowers palatability. With H. P. Rusk.....1007
Smith, C. B.: Rotations in the corn belt.....830	Snell, M. G. Machine dried soybean hay for fattening cattle....1016
Smith, E. C.....419	Machine dried versus field cured soybean hay for beef steers.....1017
Cooperation between agricul- ture and industry.....48	Snelling, W. O.: Preparation of soy sauce (patent).....1584
Smith, I. A.: Soy beans and secrets of legume inocula- tion.....545	
Smith, J. R.: World's food resources.....215	
Smith, J. T. Combines for harvesting soybeans and other crops.....4	
Community growing, handling and sale of soybean seed....4	
Smith, M. J.: Hogging down soy beans and cowpeas. With E. S. Good.....1059	
Smith, P. H.: Effect of soy bean meal and soy bean oil upon the composition of milk and butter fat, and upon the consistency or body of butter. With J. B. Lindsey and E. B. Holland.....994	

Item

Item

Soap

- Manchurian industry.....702  
 manufacture from fatty  
   acids.....681  
See also Soybean soap
- Social evangelistic center,  
 Seoul, Korea, experiments  
 on feeding soy bean milk  
 to infants.....1351
- Société anon. établissements A.  
 Olier. Apparatus and process  
 for extracting solid  
 materials (patent).....1585
- Société biologique d'extrême-  
 Orient.....135
- Société d'hygiène alimentaire.  
 Laits artificiels pour  
 l'élevage du bétail.....938
- Société française des distil-  
 leries de l'Indo-Chine.  
 Preparation of condiments  
 and particularly sauces  
 from soya (patent).....1586
- Society for chemical industries,  
 Soya bean oil for paint  
 purposes.....728
- Society for experimental biology  
 and medicine.  
   Changes in the composition  
     of blood in rabbits  
     fed on raw and cooked  
     soybeans.....1384
- Food value of soy bean  
 products.....1327
- Maintenance values for  
 the proteins of milk,  
 bread-and-milk, meat,  
 and soy bean curd in  
 human nutrition.....1349
- Nitrogen metabolism in  
 infants on graded  
 intake of soybean  
 milk proteins.....1388
- on the preparation of a  
 soluble protein extract  
 from soy beans.....1401

Society of chemical industry

- Note on a deposit in refined  
 soya bean oil.....637
- Studies of the soya-bean  
 proteins.....437
- Utilization of the soya  
 bean.....520
- Society of chemical industry,  
 Japan.  
   Effect of soya-bean-  
     lecithin on vulcaniza-  
     tion of rubber, and  
     the manufacture and  
     uses of powdered  
     rubber prepared by  
     the use of soya-bean  
     lecithin.....601
- Fermentation of soybean  
 meal.....710
- Nutritional studies of  
 the "Miso" prepara-  
 tion.....1381
- Nutritive value of  
 soybean oil treated  
 with methanol.....1273
- Nutritive value of soybean  
 powder treated with  
 methanol.....1274
- on the nutritive value  
 of hydrogenated  
 oils.....1390
- on the properties of  
 soya bean protein.....588
- Removal of solid compo-  
 nents from fatty oils  
 and drying properties  
 of the residual  
 oils.....738
- Soybean oil for soap  
 making.....681
- Study on polymerised  
 soja bean oil and  
 its soap.....678
- Utilization of the  
 soybean.....620
- Society of cotton product  
 analysts. Soya bean oil  
 committee, report.....694



<u>Item</u>	<u>Item</u>
Sodium, added to soybean oilcake, in poultry rations..1145	South Carolina. Agricultural experiment station - Continued
Sohn, K. S.	Influence of ground soybeans on market milk production.....962
Biochemical studies of soybean milk and chicken protein. With J. S. Hepburn and L. P. Devlin..1236	Protein supplements to corn in dry lot for fattening pigs.....1055
Do fu: an oriental food. With J. S. Hepburn.....1237	Rations for fattening hogs on soybean forage.....1056
Soils	Soybean forage for hogs.....1057
adapted to soybeans.....158	South Carolina cotton seed crushers' association.....35
biological activity following soybeans .....4e	South Dakota.....13,65,109,110, 590,1002,1066
erosion project, Missouri agricultural experiment station.....769	South Dakota. Agricultural experiment station.
fertility, and soybeans.....209	soybean hog feeding experiments.....1066
eastern Kansas.....129	Soybeans for dairy cows.....1002
Indiana.....4	Soybeans in South Dakota.....65
improvement, affected by time of harvesting soybeans, Missouri.....380	South Dakota State college of agriculture and mechanic arts, investigations on feeding value of soybeans for dairy cows.....1002
moisture and nitrates, following soybean hay cut at different dates.....253	South Dakota State college of agriculture and mechanic arts, Extension service. Soybeans in South Dakota.....110
<u>See also</u> Soybeans, effect on soil	South Manchuria railway co....1566
Sommer-Schmidding-Werke vertriebsgesellschaft m.b.H.	Influence of soy bean cake upon milk production and the quality of butter.....1022
Modified oils. With H. V. A.	storage of soybeans.....484
Briscoe (patent).....1587	South Manchuria railway co., Bureau of agriculture. Soya beans in Manchuria.....547
Sorensen, S. O.: Outlook for soybeans in Minnesota.....616	Southern chemurgic conference, Lafayette, La. Condensed proceedings...1936.....617
Sorghums and sorghum seed, shipments.....473	Southern fertilizer association, Soil improvement committee Soy beans.....197
Soth, L. K.: Soybean invasion of the corn belt.....217	Why soy beans?.....280
Soule, A. M.: Crops for the silo. With J. R. Fain.....933	
South Australia. Department of Agriculture. Soya bean.....277	
South Carolina....15,35,335,514,962, 1054-1057	
South Carolina. Agricultural experiment station	
Green soybeans, alfalfa, and permanent pastures as forages for fatten- ing hogs.....1054	

Item

Southern States.....4,188,213,214,  
240,319-320,492,725,778,873

Soy, Japanese. See Soy sauce

Soy beans See Soybeans

Soy flour See Soybean flour

Soy sauce.....202,551,1231,1254,1365  
characteristics.....1229  
Philippine Islands.....1170  
Chinese.....265  
composition, chemical.....1229  
Philippine Islands.....1170  
effect upon blood, phosphorus  
and sugar.....1248  
industry.....  
chemistry of.....1337  
possibilities for in  
United States.....1171  
ingredients, quantity.....1282  
Japanese, chemical compo-  
sition.....1378  
manufacture  
history.....1281  
machinery used, Staley  
sales corporation,  
Decatur, Ill.....1374  
methods.....16,206,1171,1229,  
1262,1280,1284,1337,  
1339,1405  
American.....1374  
Aspergillus flavus  
mold, compared with  
other proteo-  
lytic enzymes.....1330  
improvement in, study  
of proteolytic  
enzymes.....1330  
Oriental countries.....1198  
patent.....1515,1524,1550,  
1573,1584,1594,1596,  
1597,1603  
Philippine Islands.....1170  
possibility  
Los Baños, P. I.....609  
United States.....1198  
rice for, patent.....1552  
nitrogen percentage, time  
at which highest.....609

Item

Soy sauce - Continued  
quantity, resulting from  
given quantity of  
ingredients.....1282  
uses.....1229  
possible.....1198

Soya beans See Soybeans

Soya foods, ltd. Soyolk.....1368

Soya millers, Seattle,  
Washington, plant.....1302

Soya products inc. Produit  
végétal raffiné et son  
procédé de fabrication  
(patent).....1588

Soyama Werke Engelhardt und co.  
Preparation of artificial  
milk from soya beans  
and similar oil-bearing  
seeds (patent).....1589

Soybean adhesives.....584,588,679  
glue.....551,580  
firms selling.....538  
industry.....522  
patent.....1465  
patent.....1466,1496  
water resistant, patent....1415,  
1449,1458

Soybean axle grease.....551

Soybean bran  
composition.....1183  
digestibility.....1183  
oxidation, prevention  
process, patent.....1421

Soybean bread  
characteristics.....1174,1176,  
1229,1260  
composition 1174,1176,1219,1229  
food value.....1219,1253  
for diabetics.....1176,  
1195,1346  
manufacture.....1229  
recipe.....1397  
uses.....1229  
in French army.....1175  
less than rye-wheat  
bread.....1320  
See also Bread



<u>Item</u>	<u>Item</u>
Soybean by-products.....917	Soybean cheese - Continued
uses in feeding.....901	effectiveness in hemoglobin
Soybean cake <u>See</u> Soybean oilcake	regeneration, experiments
Soybean casein.....51,498,500,539	on rats.....1166
derived from vegetable milk...582	food value.....1316
extraction	manufacture....16,536,629,1181,
commercial.....498,604	1203,1229,1262,1280,1301,
experiments.....573	1316,1334,1339,1405,1407
method.....613,622	around Manila.....1224
glue <u>See</u> Soybean adhesives, glue	bacterial method.....536
hydrolization, patent.....1412	China.....263
preparation	from soybean milk.....1244
for glue and plastics.....573	mold responsible for....1400
industrial.....498,499,582	patent.....1417,1539
patent.....1445	possibilities, Los
production	Baños, P. I.....609
large scale, urged for	similar to Swiss cheese,
China.....622	experiments.....1278
various countries.....622	proteins, maintenance values
uses.....498	in human nutrition 1349-1350
as substitute for cow's	uses.....1229
casein.....1364	as food.....1256
in adhesives.....604,1364	<u>See also</u> Soybeans, protein
in paint industry.....1364	Soybean cream.....1298
in paper industry.....1364	preparation.....1357
in plastics.....576	sour, digestibility,
in textile industry.....1364	compared with soybean
industrial.....499,582,622	"quarg", soybean protein
<u>See also</u> Soybeans, uses	and cow's milk sour
<u>See also</u> Casein	cream.....1053
Soybean cephalin	Soybean curd <u>See</u> Soybean cheese
description.....586	Soybean elevator
extraction methods.....586	American Milling Co. (Allied
uses.....586	Mills), Peoria, Ill.....488
<u>See also</u> Soybeans, uses	Spencer Kellogg & Sons,
Soybean cheese.....202,498,499,	Inc., Chicago, Ill.....487
551,1203,1237	Soybean enamel.....551
adulteration, around Manila..1224	Soybean extract
calcium content, utilization	decolorizing and deflocu-
in adult diet.....1169	lating agent.....598
characteristics.....1229	preparation.....598
Chinese mold (mucor sufu)....1400	Soybean egg powder
composition.....629,1181,1229	antirachitic potency, proved
chemical.....1301	by calcium and phosphorus
digestion coefficient.....1334	retention of rats fed
dried, food value, with	exclusively on the diet.1341
reference to vitamin	in infant feeding .....1342
B, compared with beef	Soybean field day
and egg white.....1193	corn belt, second annual,
	Champaign and Tolono,
	Ill.....278

<u>Item</u>	
Soybean field day - Continued	
first annual, Clark County,	
South Dakota.....	109
Ohio agricultural experiment	
station.....	126
Wisconsin university.....	136
Soybean flakes.....	859
extraction of oils and fats	
apparatus, patent.....	1557
countercurrent solvent	
system, patent.....	1557
or flour, patent.....	1543
Soybean flour.....	44, 51, 141, 280, 529,
1173, 1213, 1216, 1231,	
1250-1251, 1302, 1367	
acceptance, depends on	
correct processing.....	1245
adhesive from, patent...	1455, 1502
alkaline influence.....	1250
baking tests.....	4c
basic ash quality.....	1250
biscuits	
patent.....	1540
used in French army.....	1175
calorific value, five times	
that of potatoes.....	1251
characteristics.....	567,
1174, 1178b, 1294	
cheapness, relative.....	1178a
composition.....	527, 1174,
1202, 1216, 1260, 1307, 1397	
from different processes	
of manufacture.....	4c
deodorizing and decoloring	
process, patent.....	1611, 1612
derivatives, patent.....	1516
experiments, U. S. Dept. of	
agriculture, Bureau of	
home economics.....	1395
fat value, two hundred	
times that of potatoes....	1251
firms selling.....	538
gastric digestion of,	
experiments.....	1012-1013
importance.....	1178a
1178b, 1178c, 1404	
as national food.....	618, 1251

<u>Item</u>	
Soybean flour - Continued	
importance - continued	
as staple food.....	1218
in baking.....	4c
Italy.....	1178a
to Great Britain.....	1178b
in relation to problem of	
over-population.....	1178
introduction, in relation	
to social policy.....	1178
lecithin quantity.....	1250
manufacture	
literature reviewed.....	1320
patent.....	1409, 1422, 1427,
1447, 1490, 1516, 1540,	
1542, 1581, 1606	
plant.....	1302
mineral content.....	539
new, possibilities.....	1338
processed, improved,	
complement starchy flours	
and supplement milk in	
food formulas.....	1245
protein	
content.....	539
well digested and of	
.....high biological	
value.....	1239
source of, experiments	
on dogs.....	1276
supplement to white wheat	
and rye flour	
proteins.....	1287
publications on.....	1216
recipes.....	1178b, 1189, 1395
self-raising.....	1178
stable.....	1178
production, from unextracted	
soybean, research....	1275
trade outlets.....	1213
uses.....	517, 567, 1178b, 1184,
1189, 1215, 1215, 1254, 1367	
as food...618, 936, 1174, 1178,	
1178a, 1178b, 1178c, 1189,	
1215, 1239, 1253, 1256,	
1260, 1307, 1367, 1395, 1404	
compared with other	
products.....	1178



<u>Item</u>	<u>Item</u>
Soybean flour - Continued	Soybean flour - Continued
uses - continued	uses - continued
as food - continued	in bread making - continued
experiments.....1179	with wheat flour,
importance of various	various propor-
qualities.....1250	tions.....1187
mixed with peanut	in calf feeding, compared
flour as supplement	with whole and skin
to wheat-flour	milk.....1012
proteins.....1272	in confectionery.....1178
patent.....1521	in diabetic diet.....1178
supplement to wheat	in dog food.....936
flour.....1210,1269,1270	in health food drinks
for glue, patent.....1461,	and breakfast foods..1372
1507,1508	in manufactured foods...1371
for milk bread, pastry,	in pastry making.....1178
confectionery, and	in plastic composition,
self-raising flour.....1178	patent.....1504
in baking.....539,1174,1178c	in sausage manufacturing
as substitute for	industry.....539
milk, promoted.....1364	incorporated into
as supplement to wheat	wheat products pro-
flour.....1207	notes consumption
from technical point	of wheat.....1252
of view.....1178	inhibiting development
Vienna and continental	of rancidity in
bakery.....1178b	lard.....1317
in beverages.....1253	size for cellulose-fiber
in bread making.....1176,1178	product, process,
as substitute for	patent.....1456
milk, promoted.....1364	sticker for lead arsenate
bread types produced...1202	in spraying,
defense.....1217	Indiana.....752
effect upon bread	substitute for cows'
consumption.....1253	milk in feeding
in army camps.....1209	dairy calves....1013-1014
French.....1175	to save wheat, meat, and
increases food value..1178a	fat, urged.....1395
Italy, studies stimu-	treatment of seborrheic
lated by reduction	eczema in infants....1285
of grain imports....1202	universal, should take
patent.....1484,1577	but a short time.....1251
with other flours,	war time.....1178a
patent.....1495	water resistant double
with rye-wheat flour,	decomposition adhesive,
metabolism experi-	patent.....1457
ments on human sub-	within reach of all
jects.....1320	nations.....1218

<u>Item</u>	
Soybean flour - Continued	
vitamin content.....	539
A and D.....	1250
<u>See also</u> Novo-tropon; Soybean	
oilmeal; Soybean meal;	
Soybeans, uses, food	
Soybean fodder.....	100,843
Soybean forage.....	11,16,20,29,60,89-
90,119,132,166,171,177,188,	
202,250,257,292-293,297,475,	
502,514,520,525,528,534-535,	
543,783,805,813-815,821-822,	
842,848-849,853-854,887-888,	
905,917,1057,1060,1106,1110,	
1120	
acreae.....	81
Corn Belt.....	217
selected regions and	
states.....	81
by states.....	240,462,475
California.....	232
chemical composition.....	36
compared with alfalfa and	
permanent pasture for	
hogs.....	1054
compared with cowpeas.....	815
compared with soybean oilmeal	
and tankage.....	1087
Connecticut.....	22
Delaware.....	1064
eastern North Carolina.....	562
harvesting.....	132
South Carolina.....	1057
usefulness less than use of	
beans for soil-improve-	
ment.....	294
where Government restrictions	
have been removed.....	907
yields.....	285
Missouri.....	770
<u>See also</u> Soybeans, hogged	
down; Soybeans, uses, farm,	
as feed	
Soybean glue <u>See</u> Soybean ad-	
hesives, glue	
Soybean glycinin.....	611
Soybean gruel.....	1012

<u>Item</u>	
Soybean hav.....	4b,21,29,34,68,89,
90,96,120,139,166,171,177,	
221,253,299,345,358,514,520,	
534-535,760,783,796,800,805,	
809,813-815,822,828,838,840,	
848,853-854,862,866,877,887,	
894,905,912-913,915,917,941,	
951	
acreae.....	81
Corn Belt.....	217
harvested.....	81,475
by states..	81,240,462,475
as feed.....	191,308,455,504
compared with alfalfa	
hay.....	198,957,1019
compared with alfalfa or	
clover hay, Kansas....	303
compared with cowpea	
hay.....	68
compared with other	
hays.....	90
compared with red clover,	
alfalfa, cat and	
cowpea hays.....	299
compared with red clover	
hay.....	198
compared with timothy	
hay.....	198
cut at different stages of	
maturity.....	1029
for cattle	
beef.....	917
field cured versus	
machine-dried	
hay .....	1017
compared with other	
legume hays.....	922
dairy 1002,1009-1010,1032	
caused increase in	
body weight.....	986
compared with	
alfalfa hay....	955,
957,960,975,988	
compared with	
alfalfa, lespedeza,	
and Laredo hay 1000	
compared with bran	
and cottonseed	
meal.....	960



<u>Item</u>	<u>Item</u>
Soybean hay - Continued	Soybean hay - Continued
as feed - continued	as feed - continued
for cattle - continued	for hogs, supplement
dairy - continued	to white corn
compared with	and tankage.....1061
peanut hay....970-971	for horses.....1124
compared with soybean	with corn.....1123
hay and corn	with corn and
silage.....978	oats.....1122-1123
compared with wheat	for lambs.....1150
bran and mixed	compared with red
hay.....809	clover hay and
could be substituted	soybean hay.....1150
for alfalfa.....988	mixed with concentrated
cut at different	allowance.....1150
stages of	with shelled corn....1155
maturity.....980,983	for mules.....1123
decreased milk and	for poultry.....1142
butter fat	for sheep.....917,1151-1152
production.....986	compared with alfalfa
economical.....958	hay.....1153,1161
effect upon flavor	compared with other
and composition of	legume hays.....922
milk, cream and	historical summary.....1150
butter.....1001	Missouri.....122
effected 46 per cent	avoids hay shortage....239,1019
saving in concen-	calcium content.....253
trates.....1009	calory content.....967
equal to soybean	class requirements, U. S.
silage.....976	official standards.....338
ground compared with	compared with legume hay,
unground hay.....987	Maryland.....828
palatability greater	composition, chemical...247,945
than timothy hay 1009	affected by stage of
reduced expenditure	maturity at
for mill feeds	harvesting.....253,347
93.6 percent.....1009	Mammoth variety.....887
with corn silage	same as wheat bran.....308
compared with soy-	Connecticut.....22
bean hay alone....978	costs, Northeastern Test
with vetch hay and	Farm, Ohio Agricultural
cowpea hay substi-	experiment station.....316
tute for wheat	curing.....79,358,897
bran.....964	difficulty.....906
machine dried, compared	machine-drying, compared
with field cured	..with field-curing...1016-
hay.....1016	1017

<u>Item</u>	
Soybean hay - Continued	
curing - continued	
methods.....	353
effect on hay.....	389
Missouri.....	357
cutting.....	504
time.....	344
effect on hay.....	389
demand, constant.....	19
digestibility.....	1152
easily added to 1929 farming	
program.....	1019
eastern North Carolina.....	562
extract, contains compound	
poisonous to guinea pigs...	945
grade requirements, U. S.	
official standards.....	338
handling.....	951
harvesting.....	5, 25, 79, 85, 121,
158, 293, 363, 389, 392, 774, 800,	
819, 870	
Champaign, Ill.....	83
ease.....	823
Iowa.....	151
Ianoka Farm.....	804
methods.....	123, 296, 348, 352,
358, 388	
Indiana.....	10
Missouri.....	122, 357
North Carolina.....	292
Pennsylvania.....	53
time.....	390, 980
at several stages of	
maturity.....	347
experiments.....	4e
West Virginia.....	37
history.....	358
industry, stabilized by	
uniform standards.....	342
Iowa.....	151, 914
Laredo hay, in dairy ration,	
compared with soybean	
hay.....	1000
lessens cost of feed bill.....	746
lining unnecessary.....	1019
magnesium content.....	253
marketing, effect of uniform	
standards on.....	342

<u>Item</u>	
Soybean hay - Continued	
Mississippi.....	741
metabolizable energy.....	1152
mixed	
marketing and standards..	342
with cowpeas.....	34
with other crops.....	792
with sudan grass.....	253, 871
needs no extra equipment...	1019
net energy value See Soybean	
hay, calory content	
New York.....	285
nitrogen content.....	253
phosphorus content.....	253
planting dates.....	920
potassium content.....	253
prices.....	255
field cured, compared	
with machine-dried	
hay.....	1017
one-third more than	
peanut hay.....	971
production.....	168, 363
by states.....	462
costs.....	307
accounts, Franklin	
Co., Ill.....	322
labor.....	253
of seed, an ob-	
jection.....	906
methods.....	866
better, promoted by	
uniform standards..	342
economic, Indiana....	326
Missouri.....	357
profitable.....	906
protein	
content.....	823
affected by time of	
harvesting.....	940
Missouri.....	380
compared with bran	
and cotton seed	
meal.....	960
supplied cheaper than	
linseed meal	
protein.....	1019
quality, affected by stage of	
maturity at harvesting...	347



<u>Item</u>	
Soybean hay - Continued	
rate of planting.....	920
resistance to rain.....	70
shrinkage.....	4b
South Carolina.....	1057
southern Minnesota.....	781
standards, tentative, U. S.....	342
sure crop.....	1019
value dependent upon compo- sition of plant.....	860
uses.....	64,802
varieties for.....	34,779-880
Ebony, and sudan grass in mixtures.....	253
Indiana.....	953
new.....	173
South Dakota.....	65
tested, Ohio experiment farms.....	253
vitamin A activity	
relation to vitamin A	
activity of butter of cows fed the hay.....	982
two different stages of maturity, compared with artificially dried, field cured alfalfa hay.....	982
will rank with alfalfa hay....	126
yield.....	79,183,308,455,760,866
affected by stage of maturity at harvest- ing.....	347,980
by states.....	462
compared with cowpeas.....	299
Fort Collins, Colo.....	204
Kentucky.....	124
Northeastern Test Farm, Ohio Agricultural experiment station.....	316
Pennsylvania.....	183
Soybean "kephir", preparation from soybean milk.....	1244
Soybean kounyys.....	536
Soybean lecithin.....	51,207,1290
acetone-insoluble material, effects and composition, research needed.....	628

<u>Item</u>	
Soybean lecithin - Continued	
characteristics,	
chemical.....	606
and physical, same as lecithin from eggs.....	1235
cheaper than lecithin from eggs.....	1235
commercial, obtained by Bollmann method, composition.....	1235
description.....	536
effect on vulcanization of rub- ber, same as the lipin of <u>Hevea latex</u> .....	601
extraction.....	586,608
process, patent....	1422,1500
improvement, process, patent.....	1436
patent.....	1475,1545
preparation, methods.....	599
second in importance to egg yolk lecithin.....	1314
uses.....	517,522,586,624
in chocolate manufacture.....	602
in foodstuffs in- dustries.....	606
in leather manufacture...	606
in mixture of phosphatides and fatty oils, patent...	1561
in rubber manufacture....	606
powdered.....	601
in stable aqueous emulsions of lecithin and oil, patent.....	1562
in textile industry.....	599
possible, as substitute for egg yolk in baking.....	1235
with cereal flour for bread, patent.....	1601
See also Lecithin; Soybean phosphatides; Soybeans, protein; Soybean cephalin	

<u>Item</u>	
Soybean marketing association	
marketing deal.....	406
organization, objectives, membership and operation.....	4b, 395, 406, 414
Soybean mash, food product, process, patent.....	1563
Soybean meal.....	95, 202
adoption in commercial feeds.....	185
casein manufacture from, process, patent.....	1445
constituents before and after fermentation.....	710
denatured glycinin from, compared with glycinin....	438
effectiveness, hemoglobin regeneration, experiments on rats.....	1166
extracted <u>See</u> Soybean oilmeal fermentation.....	710
fertilizer for certain plants, more profitable	710
home-made, cheap, for diabetics.....	1348
patent.....	1532
prices, important markets....	462
production, per ton of soybeans.....	572
proteins	
changes, result of storage.....	482
feed value, for young animals.....	858
food value, effect of storage on.....	482
uses.....	202, 1392
as feed.....	194
for dairy cows compared with old process linseed oilmeal.....	997
Sweden.....	973
as fertilizer.....	166, 194
as food.....	166, 194
patent.....	1453
in bread, army camps, tests.....	1209
nutrition studies with rats.....	1180

<u>Item</u>	
Soybean meal - Continued	
<u>See also</u> Soybean oilmeal; Soybean flour; Soybean oilcake; Soybeans, ground	
Soybean milk.....	74, 280, 498-500, 529, 551, 1231, 1244, 1254, 1285, 1298, 1345, 1365
advantages, over animal milk.....	1321
cake, value.....	543
calcium content, extent in meeting requirement of growing child.....	1387
characteristics.....	1188, 1229
composition....	527, 543, 629, 1229
compared with cow's milk...297, 1206, 1259, 1344	
Japanese experiment on..	1277
curdling, at lower rancidity than cow's milk.....	1236
deodorization, methods....	1182
suggested.....	1197
derivatives, patent.....	1408, 1517, 1526, 1527
drying, spray process.....	1192
fermentation, ability.....	1190
industry, Changsha, possibility for develop- ment of market for milk bottles and bottle tops.....	1271
kourmyss from <u>See</u> Soybean kourmyss	
Kwangtung province, China..	1362
manufacture.....	543, 582, 629, 1182, 1190, 1229, 1243, 1262, 1271, 1280, 1339, 1351, 1357, 1373, 1407
commercial.....	1182, 1364
for diabetics, work by Austrian chemists.....	1336
home, problems.....	1190
improvements, suggested	1197
Japanese experiment.....	1277
large or small scale for sale.....	1190



<u>Item</u>	<u>Item</u>
Soybean milk - Continued	Soybean milk - Continued
manufacture - continued	quantity, obtained at
methods, change suggested	various stages of
to remove unpleasant	preparation.....1190
taste and odor, and ad-	research.....519
dition of other	residues
nutritious ingredients	treatment, patent..1523-1529
and flavor.....1197	use, in making
patents.....1463,1474,	crackers.....1293
1478,1482,1517,1525,	taste, unpleasant, removal
1526-1529,1531,1533-	method suggested.....1197
1534,1537,1539,1403,	uses.....1229
1418,1444,1470	as food.....1188,1194,
various countries.....519	1256,1321,1362
mixed with cow's milk,	compared with cow's
detection.....1277	milk.....1403
nutrient compounds.....1197	fed to albino
other than protein content,	rats...1236,1385
less than cow's milk...1236	substitute for cow's
oil content, determination....420	milk, further work
pentosan content, varies	needed before
with filter used and size	recommended.....1403
of bean particles	France.....1206
ground in mill.....1196	hemoglobin regeneration,
powdered.....543,1343	experiments on rats..1166
digestibility, compared	in animal feeding....543,933
with cow's milk.....1343	saves animal milk
patent.....1610	and butter for
physical properties,	human consump-
similar to powdered	tion.....543
cow's milk.....1192	in infant nutrition....1292,
with supplementary foods,	1347,1369,1386
successful in test	Canton hospital.....1362
feeding of an infant...1192	for treatment of
press cake, use, in chocolate	gastro-enteritic
industry.....1293	illnesses.....1315
preventive of tuberculosis	metabolism experi-
transmission, animal	ments.....1387-1389
feeding.....543	Social evangelistic
properly called "milk",	center, Seoul,
question.....1206	Korea.....1351
protein	<u>See also</u> Soybeans,
content, about same as	uses, food, for
cow's milk.....1236	infants
digestibility	in treatment of gastro-
coefficient.....1387	enteritic illnesses
experiments with	in children.....1315
Albino rats.....1164	<u>See also</u> Milk, acidophilus
nitrogen, rate of storage 1387	Soybean miso <u>See</u> Soybean paste
	Soybean nutritional research
	council.....Page VI of Foreword

Item

Soybean oil.....16,41,51,80,93,96,  
166,192,201,266,406,515,525,  
534,535,537,543,666,696,1214,  
1365  
ability to meet competition,  
factor in expanding soy-  
bean production.....865  
acids, firms selling.....538  
adulterants, possible.....501  
analysis.....629,666,1214  
and oil markets, as affected  
by Manchuria.....144  
biochemical aspects.....903  
bleaching with roller's  
earth.....650  
blown, firms selling.....538  
by-product of soybean cake  
industry, outlet.....709  
changes in storage.....668  
color determination  
colorimetric method.....673  
cooperative readings.....694  
simple method with Greiner-  
Wesson-Peep type  
tintometer.....660  
competition.....267,477  
with Manchuria.....476  
with tung oil.....415  
composition.....663  
factors influencing.....661  
condensed summary in tariff  
bill (H.R. 2667).....494  
consumption.....474,476,477  
and production, race  
between.....658  
by industries.....618  
by classes of products...81  
drying industries.....466  
groups of industries....466  
lard-substitute,  
oleomargarine and soap  
industries.....477  
international.....476  
moved up to edible  
class.....630  
conversion process, patent...1500

Item

Soybean oil - Continued  
crude

chemical studies.....427  
disappearance.....81  
factory production.....81  
imported, prices.....467,468  
imports.....81,448  
phosphorus content.....481  
prices.....461,465  
f.o.b.....466  
tank car.....449,458  
production.....478  
purity, determination,  
Steele and Washburn  
method and Bailey's  
modification of it....668  
quality and purity,  
standards and specifi-  
cations, fixed by  
National soybean oil  
manufacturers  
association.....409,718  
refining, methods....103,523  
stocks.....81  
suitability as core binder  
for foundry work.....709  
trade, foreign.....478  
Czechoslovakia.....241  
decomposition by lipase,  
studied.....438  
demand.....716,733  
filled by American or  
Manchurian beans?.....43  
for food and the arts....126  
increasing.....453,630  
strong.....260  
description.....266,477,501  
detection.....669  
detergent power, unfavorably  
influenced by  
polymerisation.....678  
digestibility.....1240  
disposal, opportunities....697  
distribution.....654



<u>Item</u>	
Soybean oil - Continued	
domestic, prejudice against	
formerly existing.....	653
lessened through efforts	
of National soybean	
oil manufacturers	
association.....	653
need for removal.....	618
driers.....	665, 668
drying quality.....	103
effort to increase by	
breeding experiments....	643
lower than linseed oil....	643
used alone, slow.....	725
duty	
rates.....	476-477
under emergency tariff	
act of 1921.....	266
edible	
evaluation, methods.....	1293
produced for Cudahy	
Packing Co., Omaha.....	1172
qualities, chemical.....	1172
refining processes.....	1172
uses in cooking and canning	
industry.....	1172
elasticity, permanent,	
excellent.....	735
ergosterol in.....	1267
ethyl esters of, effect	
on leprosy.....	1399
exports.....	267, 448, 450,
452, 465, 476-478	
Manchuria to U. S.....	453
net, sum total over	
imports.....	452
various countries 450, 476, 1218	
extraction....	49, 550, 597, 663, 1174
apparatus and process.....	1585
patent.....	1595
by-products, treatment	
of, process, patent....	1565
effect of storage on	
yield.....	479
Iowa.....	56
machinery.....	706

<u>Item</u>	
Soybean oil - Continued	
extraction - continued	
methods.....	7, 42, 150, 194,
202, 210, 493, 517, 522,	
537, 556, 612, 624, 655,	
679, 708, 934, 1212, 1214,	
1264	
affect crushing cost..	715
Anderson expeller....	251
Boehm system,	
diagram.....	1249
by alcohol, utilization	
of by-products.....	684
by pressure, patent..	1613
effect on nutritive	
value of the	
meal.....	898
Hansa Mills, Hamburg,	
Germany.....	201
heat, effect upon	
nutritive value of	
oilmeal protein....	1234
hydraulic press	
method.....	251
improvement.....	437
influence of various	
factors on.....	208
patents.....	1464, 1567
preferred.....	635
solvent system....	251, 542
plants	
and grower, relation	
between.....	4
building costs,	
affect cost of	
crushing.....	715
cooperative, Monticello,	
Piatt county,	
Illinois.....	14
Elizabeth City,	
N. C.....	698
explosion, Momence,	
Ill.....	704
fire, causes.....	480
Hansa Mills, Hamburg,	
Germany.....	201

Item

Soybean oil - Continued  
 extraction - continued  
 plants - continued  
   interest on capital  
     invested.....476  
   list.....666  
   machinery used, affects  
     crushing cost.....715  
   outlook for.....515  
   safety measures,  
     should be included  
       in building  
       plans.....705,712  
   size, affects crushing  
     cost.....715  
   Swift & co., Champaign,  
     Ill.....723  
   research, Japan.....208  
   residues, feed value.....900  
   solvents, flammable,  
     used in soybean oil  
     extraction, ignited  
     easily.....705,712  
   speed, effect of storage  
     on.....479  
   temperature, effect on  
     efficiency of soybean  
     oilmeal protein.....1065  
   fire and explosion hazards....734  
     same as linseed oil.....676  
   firms selling.....538  
   flash point, higher than any  
     other vegetable oil used  
     in the paint industry.....667  
   freedom from discoloration,  
     excellent.....735  
   from miso, properties.....1286  
   glycerine from.....523  
   grades and standards  
     National soybean oil  
     manufacturers associa-  
     tion.....618  
   suggested by New York  
     produce exchange.....690  
   hardening process.....523  
   heat, specific, determination,  
     over temperature range  
     employed in heating them  
     to make industrial  
     products.....692

Item

Soybean oil - Continued  
   hydrogenated, composition..1214  
   hydrogenation.....1225  
   hydrolysis, Twitchell  
     reagent.....681  
   importance.....444,696  
     commercial.....150  
   maintenance, at expense  
     of selling at lower  
     price relative to  
     other oils.....630  
   imports....164,266,267,448,450,  
     452,458,460,461,465,  
     476-478,564,696  
   and imports of cocoanut  
     and linseed oil.....25  
   for consumption, value of  
     and revenue on.....477  
   from China.....263  
   net.....476  
   quality.....477  
   revenues derived from...478  
   value, various coun-  
     tries.....477  
   various countries.....450,  
     451,477,1218  
   industry.....175  
     change in.....682  
   iodine value.....637  
   Iowa.....640  
   lime soap of, in preparation  
     of fuel oil.....610  
   list of commercial oils.....669  
   Manchurian  
     enters U. S. free of  
       duty.....737  
     market, U. S.....413  
     prices, New York.....477  
   market.....43,449,658  
   determines expansion of  
     production.....401  
   European.....501  
   Manchurian repercussions  
     on.....144  
   thin, loaded with sudden  
     and interesting  
     possibilities.....658  
   world.....405



	<u>Item</u>
Soybean oil - Continued	
marketing.....	141
China.....	263
rules.....	522
National soy-	
bean oil	
manufac-	
turers associa-	
tion.....	653, 718
(cited).....	669
may be heat treated and	
blown to viscous form.....	667
mixed with tung oil.....	49
improves paint	
performance.....	725
not, source of vitamin D.....	861
odorless and colorless,	
preparation, process,	
patent.....	1612
origin.....	726
patent.....	1547
Philippine, composition	
similar to that of other	
countries.....	508
phosphatide content,	
changes, during storage....	481
physical constants.....	445, 736
polymerised, study.....	678
potentialities.....	602
prices.....	56, 81, 267, 477, 478, 696
changes.....	476
compared with linseed	
oil.....	727-728
decline not indicated.....	630
kept up by scarcity	
of lard.....	410
lower than cottonseed oil..	649
moved down from drying	
class to edible oil	
class.....	630
rise.....	478
specified localities.....	466
wholesale, Dairen,	
Manchuria.....	477
processing, loss in.....	668
producers, list of.....	669

	<u>Item</u>
Soybean oil - Continued	
production.....	4, 19, 81, 141, 220, 266, 267, 448, 461, 465, 470, 471, 474, 476, 478, 549, 629, 654, 917
and consumption, race	
between.....	658
beginnings at Elizabeth	
City, [N. C.] Oil	
and Fertilizer Co.....	563
commercial scale	
provides new profit-	
able market outlet	
for soybeans.....	649
successful.....	649
costs.....	251, 267, 476
China.....	476
data compared.....	476
Great Britain.....	476
Japan.....	476
methods of calcula-	
tion.....	251
factors influencing.....	661
foreign countries....	476-477
inaccurate ideas	
corrected.....	677
increase	
bearing on soapmaker's	
raw material	
situation.....	516
counteracted by in-	
creasing demand....	630
methods.....	43, 103, 141, 251, 477-478, 696
patent.....	1448, 1475
per ton of soybeans.....	572
practicability, from	
engineering standpoint	
Corn Belt.....	251
Iowa.....	251
Swift & co., extraction	
oil plant, Champaign,	
Ill.....	723
See also Soybean oil,	
extraction	
propaganda, suggested.....	659

<u>Item</u>	
Soybean oil - Continued	
properly treated, as substitute for up to 100 per cent of oil vehicle in many varnishes.....	691
properties and characteristics.....	103,428,478,516,521,567,661,663,706,726
data supplied by producers.....	669
effect of variety, maturity and soundness on.....	440
inaccurate ideas corrected.....	677
make it necessary to paint, industry.....	675
physical and chemical.....	17,428,523,696
purity, determination, hexabromide test.....	632
Steele or Bailey method.....	664
quality.....	697
affected by conditions of expression.....	711
effect of moisture content of beans on.....	711
effect of temperature of pressing on.....	711
standards, National soybean oil manufacturers association.....	653
re-exports.....	448
refined.....	1256
blown, suitable for printing ink.....	677
by sulphuric acid, deposit.....	637
refining .....	587,738
analysis, for loss.....	731
gives good drying oil.....	738
laboratory practice.....	731
method.....	663,738,1212
readings, by daylight and using daylight lamp.....	730
results.....	738
reversion, problem.....	1212

<u>Item</u>	
Soybean oil - Continued	
research needed.....	1212
resists freezing and thawing tests, as well as asphalt and tar.....	647
rules governing transactions.....	694
amendment of National soybean processors association.....	409
formulated by Interstate cottonseed crushers association.....	690
sales necessary.....	658
to manufacturers of soap and to edible oil refiners.....	682
saponification step, quantity of caustic soda lye should not exceed 8.5° Bé.....	681
value.....	637
self-sufficiency.....	478
sources.....	476,706
specific gravity.....	668
statistics.....	458
stearine, firms selling.....	538
stocks See Supply	
substitution or interchangeability	
for edible purposes...	494
with core oil, suitability.....	642
with cottonseed oil for practically all purposes....	649
in soap making.....	680
with lard.....	1225
with linseed oil incomplete.....	675
in paints..	672,675,727
in soap making.....	680
with oil constituent in many varnishes..	707
with oils used in paints, varnishes and oilcloth and soap making.....	494



<u>Item</u>	<u>Item</u>
Soybean oil - Continued	Soybean oil - Continued
substitution or inter-	uses - continued
changeability - continued	as diluent for core
with other oils and fats	oils.....642
consuming industries 476	as feed.....861,903
data received from	for dairy cows.....994
questionnaires....476	for poultry.....1126,1128
with other products,	as grinding vehicle for
possibilities.....716	paste colors.....634
with rapeseed oil,	as outlet for soybeans,
economic factors	more profitable than
affecting.....733	hog feeding.....1040
supply.....470-471,474,733	as plasticizing agent in
international.....476	production of cold-
tariff	vulcanized rubber.....651
history.....477	as ungelled drying oil
needed.....581	product suitable for
policy.....478	varnishes, patent....1558
rates.....81	eastern North Carolina...562
Smoot-Hawley hearings.....144	food.....25,459,494,522,
technical value.....445	523,533,699,1212,1249,
trade	1254,1256,1324,1390
Africa.....448	antirachitic value...1266
Asia.....448	compared with butter 1335
channels.....1212	process, patent.....1468
Europe.....448	treated with
foreign and inter-	methanol.....1273
national.....300,448,	for curd soaps.....681
452,461,465,477	for paste colors.....668
types, special, used in	for printing inks.....459
certain foods, margarines,	in asphaltum manufac-
salad oil and vegetable	ture.....699
shortenings.....1212	in coddling moth control,
unsaponifiable constituents,	combined with lead
phytosterol isolated,	arsenate and lime.....662
acquisition of antirachitic	in compounds.....459
property by irradiation.....1266	in emulsion manufacture,
uses.....3,4c,16,19,41,43,68,	patent.....1579
74,81,85,89,97,103,141,194-	in enamel manufacture....699
195,202,208,221,266,267,296,	with Beckacites.....677
330,476-478,491,493,497,501,	in Ford motor company
504,516,517,527,529,547,556,	plant.....579
561,563,564,567,587,635,663,	in lard-compound
669,690,706,726,1254	industry.....733
as agent increasing elongation	in linoleum manu-
of rubber.....651	facture.....25,459,699
as bactericide.....693	in manufacture of
	japans.....699

Item

Soybean oil - Continued

uses - continued

in margarine industry.....733  
in oilcloth manufacture....159,  
699

in paint and varnish  
manufacture....4a, 4d, 25, 49,  
459, 493-495, 506, 524,  
537, 624, 638, 643, 667,  
675, 686-688, 699-700,  
713, 735

blended with tung  
oil.....603

cannot substitute for  
linseed or hempseed  
oil.....633

cheaper than lin-  
seed oil.....643

firm establishment...667  
for interior painting

equals linseed  
oil when treated

with tungate  
drier.....727

too early to  
prognosticate

value.....727

greatest potential  
market.....725

highly desirable when  
intelligently

handled.....672

investigation.....4b, 696

justification.....689

literature reviewed..635

mixed with oil of  
better drying

qualities.....735

not ideal, because of  
poor drying

qualities.....735

patent.....1587

possibilities.....721

studies made by

Illinois agricul-  
tural experiment

station.....638

Item

Soybean oil - Continued

uses - continued

in paint and varnish manu-  
facture - continued

substitute for  
linseed oil,  
unsatisfactory..713

tested, Washington,  
D. C., paint

tests, Institute  
of industrial

research.....670,  
671, 701

treatment.....686

weather tests..707, 719

will supplement  
scarcity in flax-

seed crop.....728

in pharmaceutical  
preparations.....524

in reclaimed rubber  
preparation.....685

in resin coating compo-  
sition, patent.....1492

in rubber substitutes...494,  
523

process, patent.....1480

in salad oil manu-  
facture.....699, 733

in stabilization of  
earth roads,

possibilities.....647

in stable mixtures con-  
taining vegetable

lecithin, patent.....1530

in the foundry.....4c, 709

in vegetable shortenings 459

in waterproof cement.....523

in waterproofing materials  
manufacture....25, 699, 737

inaccurate ideas

corrected.....677

increasing.....175

industrial....17, 60, 496, 506,

522, 533, 557, 639, 654,

659, 711, 1214

See also specific

industrial uses



<u>Item</u>	
Soybean oil - Continued	
uses - continued	
miscellaneous.....	459
new, need for developing...	337
possibilities.....	292
<u>See also</u> Soybeans, uses	
valuation, standard, pro-	
posed.....	501
value per bushel of soybeans...	81
varieties for.....	34
viscosity, changes, studied...	438
vitamins	
content.....	861
vitamin A	
content.....	1242
conclusions from	
clinical studies	
with infants.....	1226
removal	
by activated carbon...	674
by synthetic sodium	
aluminum silicate,	
ineffective.....	674
source of.....	861
suppressing factor.....	974
vitamin D, economic value	
as source of.....	1267
vitamin E content.....	1380
tested in breeding	
experiments on rats	1379
work done by Paint manufac-	
turers' association,	
Educational bureau.....	697
yield	
affected by conditions	
of expression.....	711
as great as cottonseed	
oil.....	298
usually found.....	441
<u>See also</u> Oils; names of kinds	
of oils	
Soybean oil manufacturers asso-	
ciation, trading rules	
(cited).....	669
Soybean oilcake.....	51,192,194,
	525,535,543
addition to other grain,	
effect.....	934,1265

<u>Item</u>	
Soybean oilcake - Continued	
composition.....	247
decomposition, two different	
soils, effect of	
calcium oxide and	
calcium carbonate.....	811
digestibility.....	911,1183
expense, for use in	
nutrient media.....	585
exports	
Manchuria to U. S.....	453
various countries.....	1218
firms selling.....	538
hydrolyzation, for season-	
ing material similar	
to soy sauce, patent....	1566
imports...25,81,130,164,460-461	
for consumption,	
revenue on.....	477
various countries.....	1218
industry, utilization of	
by-product oil in.....	709
Iowa.....	640
marketing, on world	
market.....	405
oil content.....	629
peptone from, prepared by	
peptic digestion,	
advantages in cultural	
media.....	571
preparation, for use in	
nutrient media.....	585
prices, Dairen, Manchuria...	477
production, various	
countries.....	220,543
products derived from.....	513
protein content.....	629,911
digestible, compared	
with other feeds.....	887
purification.....	437
storage tanks, fire in.....	483
tariff rates.....	81
trade, foreign.....	300
uses.....208,491,504,887,917	
as briquets, patent....	1532
as feed.....126,513,722,733,	
	892,895-896,902,1264,
	1265,1377

<u>Item</u>	
Soybean oilcake - Continued	
uses - continued	
as feed - continued	
alcohol extracted..934,1264	
combined with mineral	
mixture.....126	
compared with	
decorticated cotton	
cake.....891	
compared with linseed	
cake.....959	
compared with palm kernel	
cake, palm kernel	
meal and coconut	
cake.....885	
experiments with young	
rats.....1242,1377	
for dairy cattle.....996	
Danish experiments...999	
effect on butter	
quality.....1006,1022	
Danish ex-	
periments..999	
effect on milk..996,1022	
Manchuria.....1022	
Sweden.....973	
for hogs, added to hog	
feed, equal to fish	
meal.....1108	
for poultry...536,1144-1145	
digestion coef-	
ficient.....1143	
similar to meat or	
caseinogen.....911	
with calcium, sodium	
and chlorine equals	
fish meal protein...1145	
as fertilizer.....733	
food...537,934,1256,1264,1265	
in artificial marble	
manufacture.....629	
in colloidal solution,	
neutral to the taste,	
patent.....1535	
in glue manufacture,	
patent.....1505	
industrial.....60,639	

<u>Item</u>	
Soybean oilcake - Continued	
uses - continued	
manufacture of proteolytic	
enzymes by means of	
micro-organisms,	
patent.....1428	
substitute for peptone,	
in preparation of	
nutrient media.....585	
See also Soybean oil,	
uses; Soybean oilmeal,	
uses; Soybeans, uses	
vitamin content	
vitamin A	
deficiency in.....911	
greater when oil is	
removed by pressure	
than with	
solvents.....722	
vitamin B.....1242	
See also Oilcake; Oilmeal;	
Soybean oilmeal; etc.	
Soybean oilmeal....73,89,175,192,	
406,515,525,534,814,1091	
ability to meet competition,	
factor in expanding soy-	
bean production.....865	
ash value.....445	
availability, not general,	
until recently.....1137	
bagged prices, specified	
markets.....81	
calcium and phosphorus	
content, determination..1183	
chemical analysis...445,521,708	
color, not infallible	
criterion of nutritive	
value.....1149	
composition.....563,696,1183	
confused with other	
products.....1011	
consumption, greater,	
important.....656	
demand, strong.....260	
digestibility.....1152,1183	
by man, food trials....1305	
coefficient.....1073	



<u>Item</u>	
Soybean oilmeal - Continued	
distribution.....	654
effect on rate of hemoglobin regeneration, nutritional anemia in rats and mice.....	1333
expeller process	
digestibility.....	944
effect of temperature, experiments on.....	868
optimum heat to be applied.....	1149
vitamin A suppressing factor.....	974
fat content <u>See</u> Soybean oil- meal, oil content	
firms selling.....	538
flavor	
not an infallible criterion of nutritive value.....	1149
raw and beany, indicates insufficient applica- tion of heat and re- sulting protein deficiency.....	1149
grades, several, on market, vary in palatability.....	1011
hydraulic type	
effect of temperature on... optimum heat to be applied.....	868
importance, commercial.....	150
imports.....	25,81,460,461,733
market.....	697
determines expansion of production.....	401
place on European.....	501
marketing.....	141
metabolizable energy.....	1152
new process.....	859
objectionable constituents, removal by use of certain extractives, possibility..	1183
oil content.....	445
maximum of 6% produced.....	655
palatability, lowered by "toasting".....	1007

<u>Item</u>	
Soybean oilmeal - Continued	
poisonous substances	
present, determination..	1183
potentialities.....	602
prices.....	19
on protein basis, equal to meat scraps or tannage, hinders wider use....	1137
selected markets.....	466
production..4,4c,220,470,471,654	
at low temperatures gives poor results, experiments.....	952
beginnings, Elizabeth City, [N. C.] Oil and Fertilizer Co.....	563
commercial scale	
successful.....	649
provides new profit- able market outlet for soybeans.....	649
methods.....	103
A. E. Staley Mfg. Co., Decatur, Ill.....	163
experiments.....	49
modern.....	141
with trichlorethylene, inadvisable.....	1021
<u>See also</u> Soybean oil, extraction	
proteins	
content.....	445,572,1088
compared with cotton- seed meal.....	649
high.....	925,1011
deficiency, indicated by raw and beany flavor.....	1149
source, satisfactory, produced expeller, hydraulic and solvent processes.....	1149
solvent type	
effect of temperature on.....	868

Item

Soybean oilmeal - Continued  
 solvent type - continued  
   heat to be applied.....1149  
   vitamin A suppressing  
     factor.....974  
 supply not great enough to  
   permit all-round use  
   in commercial feeds on  
   large scale.....1011  
 tariff.....  
   needed.....581  
   rates.....81  
 uses.....19,43,81,85,141,150,  
   296,330,471,497,504,517,  
   529,564,655,698,1242,1392  
 as base material in gluing  
   process, patent...1460-1461  
 as emulsifier of mineral  
   oils for dormant spray  
   purposes.....657  
 as feed.....4d,56,563-564,708,  
   733,859,869,876,892,  
   896,899,922,924,929,  
   935,942,952,1007,1011,  
   1142,1234  
 affected by processing  
   method.....4d  
 compared with corn  
   gluten meal and  
   linseed oilmeal.....1162  
 compared with cotton-  
   seed meal.....963  
 compared with linseed  
   oilmeal.....944  
 compared with other  
   protein supplements 1049  
 conflicting results.....7  
 Corn Belt.....932  
 dependence of satisfactory  
   market for commercial  
   soybeans upon.....932  
 effect of heat in oil  
   extraction.....1149,1234  
 effect on blood form....883  
 for beef cattle.....917  
 for cattle.....56,875,884  
   auxiliary foodstuff,  
     excellent.....1021

Item

Soybean oilmeal - Continued  
 uses - continued  
   as feed - continued  
     for cattle - continued  
       cases of poison-  
         ing from.....1020  
       alleged.....1018  
       cause of "Durenner"  
       sickness in  
         cattle.....989  
       effect of extraction  
         at lowest  
         temperature....1007  
       effect upon blood  
       form.....1008  
       Ohio Agricultural  
       experiment  
       station.....968  
       relative advantages  
       and disadvant-  
       ages.....1003  
       for dairy cattle....963,  
       966,984,994,1005,1025  
       compared with  
       ground soy-  
       beans.....1000  
       compared with lin-  
       seed oilmeal...965-  
       966,977  
       does not affect  
       purity or taste  
       of butter.....1034  
       not so prevalent as  
       its value and  
       importance  
       warrant.....1011  
       with home-grown  
       cornmeal, economy  
       of milk pro-  
       duction.....963  
       for hogs.....4b,4c,4e,56,  
       904,917,1050,1084,1092  
       better than ground  
       or whole soy-  
       beans, Corn  
       Belt.....1109  
       compared with lin-  
       seed oilmeal...1087



<u>Item</u>	<u>Item</u>
Soybean oilmeal - Continued	Soybean oilmeal - Continued
uses - continued	uses - continued
as feed - continued	as feed - continued
for hogs - continued	for hogs - continued
compared with	with corn - continued
other con-	with corn meal,
centrated	more effici-
feeds.....1063	ent than corn
compared with	meal and
soybeans.....1040,1087	linseed
compared with	meal.....1104
tankage.....1087	with corn meal,
compared with wheat	produces greater
middlings.....1070	gains than wheat
digestion experi-	middlings and
ments.....1073	corn meal in
effect of extraction	same propor-
method on...1084,1088	tion.....1070
effect on quality	with limestone
of pork.....1080,	and bone meal..1037
1113,1114	for lambs
cause of soft	with corn and corn
pork.....884	stover equals
experiments, Ohio	linseed oilmeal
agricultural ex-	and corn gluten
periment	meal in protein
station.....1088,1089	utilization....1159
in combinations.....917	with corn and
methods.....1083	timothy hay,
without deleteri-	equals linseed
ous results,	oilmeal and
sought.....1039	corn gluten
Minnesota agricultural	meal in protein
experiment	utilization....1159
station.....1049	with shelled corn 1155
protein efficiency..1065,	with shelled corn
1090	and soybean
value and economy...1075	straw on hull-
with corn.....708,1055,	ings.....1156
1069,1070,1087,	for poultry...56,884,952,
1090,1120	1129,1135,1136,
compared with	1141-1142
linseed oil-	advantage over
meal.....1087,1104	soybeans.....1142
compared with soy-	compared with meat
beans and	and bone meal
tankage..1084,1087	of Polish
	origin.....1130

<u>Item</u>	
Soybean oilmeal - Continued	
uses - continued	
as feed - continued	
for poultry - continued	
Illini soybean	
deficient in	
some factor	
necessary for	
hatchability.....	1127
mineral deficiency,	
need for sup-	
plying.....	1142
prepared at different	
temperatures.....	1131
recommended.....	517
substitute for meat	
scraps or fish	
meal.....	1137
substitute for	
tankage.....	1134
unequalled by other	
vegetable pro-	
teins.....	1137
with addition of	
mineral salts....	1138,
	1140
for rabbits.....	1020
for sheep..	56,917,1152,1158
metabolism experiments..	875
prepared by different	
methods of oil	
extraction.....	898
produced at Swift & Co.	
extraction oil	
plant, Champaign,	
Ill.....	723
recommended.....	517
superior to linseed oil-	
meal and corn gluten	
meal.....	1162
value determination with	
experiments on rats	
and swine.....	1101
with corn.....	1272
as fertilizer.....	150,733
as protein supplements,	
rather than fattening	
foods.....	922

<u>Item</u>	
Soybean oilmeal - Continued	
uses - continued	
food.....	537,563-564,1256
bread	
recipe.....	1358
use in diabetic	
and obesity	
diets.....	1358
for diabetics, work	
done by Austrian	
chemists sum-	
marized.....	1336
patent.....	1556
for adhesive purposes....	636
Ford motor company	
plant.....	579
in plastics manufac-	
ture.....	495,506
in preparation of paper	
sizing.....	506
in treatment of pyuria..	1307
industrial...496,557,654,655	
methods, for best	
results.....	899
new, need for develop-	
ment of.....	337
possibilities.....	292
results by various ex-	
periment stations.....	708
<u>See also</u> Soybean meal,	
uses; Soybean oil,	
uses; Soybean oilcake,	
uses; Soybeans, uses	
value	
exchange.....	563
per bushel of soybeans....	81
vitamin content	
A and B.....	857
B.....	1242
G, low and not affected	
by manufacturing	
processes.....	1149
whipping ability, to re-	
semble egg white.....	1313
yields in	
greater than cottonseed	
meal.....	298
usually found.....	441



<u>Item</u>	<u>Item</u>
Soybean oilmeal - Continued	Soybean plastics - Continued
<u>See also</u> Soybean flour; Soy-	uses - continued
bean meal; Soybeans,	Ford motor company
protein; Oilmeal	plant.....579,605
Soybean oil soap <u>See</u> Soybean	Soybean potash, used in
soap	preparation of potash lye
Soybean paste	for boiling straw.....621
in salad dressing.....1220	Soybean powder, food value,
nutritional studies with	treated with methanol.....1274
rats.....1381	Soybean press-cake <u>See</u> Soybean
oil, nature of.....1214	oilcake
preparation.....1286	Soybean production advisory
Soybean phosphatides.....586	board, Cedar Rapids,
as commercial products.....606	Iowa.....141
extraction	Commercial growing of
commercial and laboratory..587	soybeans in Iowa.....152
effect of storage on	Soybean products.....35,41,50,51,
yield and speed of.....479	511,541,552,561,683,1163,
patent.....1555,1564	1167,1178b,1229,1339
obtained as by-product of	analyses, France.....1175
soybean oil	chief.....607
antirachitic vitamin...1359	commercial, produced through
vitamin A content.....1359	research by A. E.
patent.....1477	Staley Manfg. Co.....510
predominant in vegetable	composition, chemical.....554
line.....606	defined, by National soybean
purification, process,	oil manufacturers asso-
patent.....1432,1434	ciation.....331,720
saponification, chemical	demand
methods.....648	filled by American or
uses.....587,628	Manchurian beans?.....43
further research	greater, necessary for
needed.....628	continued outlet for
<u>See also</u> Soybean lecithin;	large share of crop...656
Soybean cephalin	description.....554
Soybean plastics.....539,570,	economic position.....81
572,576,591	exhibited by American
capable of replacing	Soybean Association.....80
celluloid, patent.....1451	exports.....470-471
development, experimental,	demand for.....4d
Ford motor co.....594	various countries.....245
flow, measurement.....570	France.....1175
patent.....1504,1523	imports.....470-471
preparation.....574,587	European countries,
two types, produced by	statistics unavail-
soybean proteins.....570	able.....264
uses.....619	various countries.....245

	<u>Item</u>
Soybean products - Continued	
industrial.....	500,531
industry, code of fair competition.....	732
interest	
growing, various countries.....	1255
shown by industry in.....	30
iron and copper content appreciable.....	1166
literature summarized.....	1322
market.....	4a,43
increase unlikely in near future.....	401
indicated by demand for vegetable oils and meals.....	164
potential, large.....	626
material made from.....	563
preparation and analysis.....	629
patent.....	1439,1473,1488,1588,1591
prices.....	245
lower than other seed products, European countries.....	264
production.....	25
Far East.....	264
secured by oil mills in crushing.....	565
secured from ton of soybeans.....	563
supply.....	245
tariff regulations.....	265
trade	
foreign and international.....	97,418
restrictions affecting.....	418
various countries.....	97
uses .....	25,517,532
as feed	
for beef cattle.....	4e
for dairy cows.....	4c
for sheep.....	4e
experiments.....	1152
as food flavoring material, patent.....	1510

	<u>Item</u>
Soybean products - Continued	
uses - continued	
difficult, without addition of some material to improve the flavor.....	1053
extended.....	498
for pork production.....	4e
outline.....	167
various countries.....	560
See also Soybeans, food products, and names of specific products, as Soybean oil; Soybean oilmeal; etc.	
Soybean products, inc.....	152
Soybean "quarg", digestibility, compared with soybean sour cream, soybean protein and cow's milk sour cream.....	1053
Soybean refuse, paste from, patent.....	1493
Soybean research institute, Tokyo. Hokubei Gasshu-goku ni okeru daizu no seisan narabini riyo no genkyo.....	165
Soybean seed...89-90,104,132,166,294,299,306,382,515,520,525,535,556,760,805,813-815,821,853	
acreage.....	139
leading states.....	5
adulteration, South Carolina.....	335
advice to buyers of.....	286
and farm improvement problem, sandy-land areas, northern Indiana and southern Michigan.....	768
as element in cost of production of soybeans.....	4e
availability, considered, in determining best varieties for New York...	285
certified.....	4a



<u>Item</u>	<u>Item</u>
Soybean seed - Continued	Soybean seed - Continued
characteristics.....55	production.....168,998
effect of variety,	cost.....176
maturity and soundness	labor.....253
on.....440	eastern North Carolina...562
cleanliness.....378	increasing, Iowa.....141
community growing and	methods, Cerro Gordo
handling.....4	county, Iowa.....950
compared with cowpeas.....232,815	normal, compared with
Connecticut.....22	planting requirements,
curing .....294,369	by counties, map.....473
damage in harvesting.....378	quality, determination.....536
defined.....399	quantity
demand.....398,473	ordered through farm
seasonal, expected to	bureaus, Illinois.....235
offset price-depressing	used.....81
effect of possible	per acre.....465
decline in meal	sale, community.....4
prices.....260	sandy soils.....76
drying.....5,177	scarcity.....76
frauds.....4	shipments.....179,473
false-label, South	by states.....474
Carolina.....335	sources of supply.....473
harvesting <u>See</u> Soybeans,	southern Minnesota.....781
harvesting	stocks.....184
imported, undesirable.....259	by states.....474
market notes.....473	storage.....34,64,79,177,180,
new, value, based on 1924	199,202,250,369,373,489
yields.....173	Kentucky.....124
New Jersey.....40	methods, to prevent
northern grown, scarcity,	deterioration and
indicated by prices.....286	loss.....332
outlook.....473	<b>tests.....34</b>
pooling, Laredo Bean	Ohio.....253
growers' association,	<b>value.....802</b>
Marshall County, Tenn.....91	varieties, misrepresenta-
prices.....131,473,760,823	tion.....116
by states.....474	<u>See also</u> Soybean
Corn Belt.....283	seed, frauds
higher than corn and	varieties for.....112,779-780
small grain, indicates	West Virginia.....37
scarcity of northern	worth more than for
grown soybean seed.....286	swine feeding.....1094
retail.....474	yield.....29
by states.....463	Soybean silage.....21,29,66,68,89,
wholesale.....461-462,464-465	120,158,166,240,253,296,301,
principal markets.....464	392,520,534-535,774,783,792,
	801-802,812-813,815,822,828,
	849,853-854,862,887,905,917-
	918,920,933,998

Item

Soybean silage - Continued  
 compared with corn.....745  
 Connecticut.....22  
 eastern North Carolina.....562  
 feasibility, Florida.....864  
 fed to beef cattle.....145  
 fed to dairy cattle.....145  
   equal to soybean hay.....976  
   substitute for purchased  
     feeds.....992  
 fed to sheep.....1157  
 feeding tests.....881  
 Mississippi.....741  
 New Jersey.....40  
 New York.....810  
 objections, do not apply  
   to corn-soybean silage....1033  
 preserved with molasses,  
   feeding tests.....881-882  
 varieties for.....908  
   suggested, Indiana.....953  
 West Virginia.....37  
 Wisconsin.....1033  
 with corn.....88,126,139,145,  
   171,187,745,817,897,920,  
   931,946,1026  
   advantages 789,908-909,946,949  
   compared with pole beans...948  
   decreases unit cost of  
     production.....1026  
   gives balanced ration.....915  
   Lafayette County, Wis.....909  
   Ohio Agricultural experi-  
     ment station.....939  
   profitable.....949  
   recommended to dairyman,  
     New York State.....1026  
   reduces concentrates  
     necessary.....1026  
   yield per acre  
     increased.....949  
   Wooster, Ohio.....253  
 with corn and sunflowers.....910  
 with sudan grass, compared  
   with soybeans and sudan  
   grass alone.....954  
 Soybean soap.....25,459,493-494,  
   523-524,551,679,699,733

Item

Soybean soap - Continued  
 appearance, not made worse  
   by action of air.....678  
 characteristics.....680  
 lathering capacity, not  
   affected by water  
   hardness.....681  
 manufacture, methods.....680  
 polymerised, study.....678  
 quality, not made worse by  
   action of air.....678  
 soft soap.....681  
 tenacity, increased by  
   polymerisation.....678  
 Soybean sprouts  
   composition.....1312  
   food value.....1312  
   preparation.....1280  
   source of vitamin C.....1289  
 Soybean straw.....34,188,369,  
   504,534,905  
 as feed  
   eastern Kansas.....129  
   for horses and mules....1122-  
     1123  
   for lambs.....1155  
   with shelled corn,  
     supplemented with  
     soybean products  
     and linseed oil-  
     meal.....1156  
   for sheep.....1152  
   southern Minnesota.....781  
   digestibility.....455,1152  
   metabolizable energy.....1152  
 Soybean stubble, composition  
   and weight affected by  
   stage of maturity at  
   harvesting.....347  
 Soybean sucrose, obtaining,  
   methods.....592  
 Soybean tankage, fed to hogs,  
   gives quicker and more  
   economical gains than  
   soybeans.....1040



<u>Item</u>	<u>Item</u>
Soybeans.....3,58,80,87,134, 148,154,165,170,193-194,203, 222,226,260,275-276,281,297, 315,438,464,473,518,568,602, 688,834-835,847,1071,1291	Soybeans - Continued
absorption by industry at price justifying increase of farm output, possibili- ties.....224	acreage - continued
acreage...81,104,112,191,240,447, 461-462,464-466,474-475, 1174	inspection, means of obtaining higher yields.....177
by counties.....475	Iowa.....783
by states...81,462-464,472,475	map.....467-468,475
compared with corn alone	Nebraska.....247
and corn drilled with	1935 100 times that of 1907.....459
soybeans, Ohio state	states adjoining
university farm.....818	Nebraska.....247
Corn Belt.....217	various countries....452,454
decrease.....447	Adams County, Ill.....827
cause for higher prices 925	adaptability..21,35,119,558,724
doubled through con- tracting, Illinois.....417	as emergency crop for forage, Massachusetts 863
grazed off.....81	Canada.....210
harvested.....81,462	Delaware.....79
by states.....81,462,475	hog raising sections, Virginia.....7
Illinois.....456	Illinois.....86
increase.....41-42,54,108, 134,413,447,605,1406	Kansas.....303
A. P. Meharry farm, Champaign, Ill.....237	limited to sections where corn can be grown for grain, Michigan.....532
Corn Belt.....288-289	Middle West.....246
Illinois.....275	Minnesota.....616
Indiana.....235	Montana.....196
Iowa.....151,225,1024	Nebraska.....120
Missouri.....380	Oklahoma.....161
necessary and certain...894	South Carolina.....514
Ohio.....365	Tennessee.....210
rapid, problem of utilization.....904	to insect attacks, compared with lima beans.....190
reasons.....13,415	to soil and climatic conditions....46,128,158, 174,736,755,764,798
slow, reasons for, Ohio.....178	Canada.....55
South Carolina.....1057	compared with cowpeas.....844
Southern States.....240	Montana.....196
through cash market.....185	Oklahoma.....121
through use of com- bines.....185	to weather, compared with lima beans.....190
Wisconsin.....225	See also Soybeans, varieties, adaptation and develop- ment

<u>Item</u>	
Soybeans - Continued	
adjoining corn, profitable....	772
advantages of crop..23,70,74,148,	
288,369,512,575,639,870,912	
accounting for rise in	
favor.....	764
Corn Belt.....	788
financial, Iowa.....	914
from soil standpoint.....	829
greater than clover.....	307
in cropping system.....	756
Ireland.....	1178
over cowpeas.....	743
over navy beans.....	1318
over other crops.....	176
over other oil-bearing	
seed crops, North	
Carolina.....	292
See also Soybeans, uses	
advocated, Louisiana.....	298
agrotechny.....	101
albumin from, production	
method, patent.....	1576
albumino-caseins, extraction	
process, patent.....	1416
albuminoids content, compared	
with other food products..	1353
American grown	
possibilities of develop-	
ing a manufacturing	
industry.....	194
quality, good and reception	
in Europe favorable.....	411
amino acid	
content, varies with	
variety.....	430
deficiency, growth in	
white rat.....	1311
ammonia content, determina-	
tion.....	425
analysis.....198,208,427,445,1310	
chemical.....297,1224,1296,1319	
for oil mill purposes.....	425
methods.....	646
method studied by American	
oil chemists' society...645	
Russian investigators	
quoted.....	1322

<u>Item</u>	
Soybeans - Continued	
analysis - continued	
sample.....	425
value of adopting oil	
and protein content...441	
and commerce.....	43
and nitrogen problem.....	838
and nitrogen, protein	
and vegetable oil	
problems.....	251
and other seed products,	
relative merits.....	264
and permanent agriculture,	
Indiana.....	63
and protein problem.....	838
and Sino-Japanese conflict..	200
and tariff.....	141,275
application	
to manufactured	
products.....	220
to rural economy.....	58
Argentina.....	554
Arkansas.....	180
as labor saver, recommended	743
as link between agriculture	
and industry.....	73
as raw material for	
industry.....	92,568,616
chemical industry.....	241
interest growing.....	577
plastic industry.....	572
research needed.....	577
See also Soybeans,	
uses, industrial	
as soil builder See Soybeans,	
effect on soil	
as source of oil and	
protein.....	79
as staple crop, profit-	
ability questionable.....	188
as vegetable crop.....	40
ash content determination,	
methods.....	432
assure legumes for dairy	
farms.....	817
at different stages of	
maturity.....	390



<u>Item</u>	
Soybeans - Continued	
attempt to establish as	
means of subsistence in	
Europe and U. S.....	130
attract attention of all	
handlers and merchan-	
disers.....	249
Biloxi	
as green forage for	
fattening hogs, com-	
pared with Ootootan	
variety.....	1054
Louisiana.....	794-795
Black Hawk County, Iowa.....	23
blacktongue preventive	
action.....	1227
boiling directions.....	1182
boon to grain trade.....	249
botany .....	77,192,241,248
breeding.....	4e
bring about diversified	
farming, cotton belt.....	761
by-products.....	35
protected by tariff from	
foreign competition.....	129
uses.....	42,225
calcium content.....	1310
Canada.....	55,142
canned, raw, used in French	
army.....	1175
carbohydrates	
character and bearing on	
nutrition.....	1183
content, low.....	954
digestibility.....	1183
food value, experiments on	
white rats.....	1324
quantitative separation	
complete, attempted....	1375
carrying capacity per acre,	
hogging down.....	1060
Cayuga, history, description	
and chemical composi-	
tion.....	284
census, farms reporting.....	475
characteristics.....	55,87,251,
	297,1174,1332

<u>Item</u>	
Soybeans - Continued	
characteristics - continued	
chemical.....	103,529
and physical.....	428
economic, in relation to	
improvements in	
marketing.....	245
unpossessed, should not	
be attributed to	
them.....	1398
valuable.....	912
chemistry.....	493,1200,1290
from an industrial point	
of view.....	49
classification.....	208,404,894
claytonization.....	485
commercial significance	
of <u>See</u> Soybeans, as	
cash crop	
compared with cotton-seed	
meal.....	822
compared with other crops...	805
composition.....	5,60,77,
	119-120,132,146,203,247,
	440,690,809,1260
changes	
during ensiling	
process.....	918
toward maturity,	
related to use	
as green manure....	739
chemical.....	17,58,161,297,
	513,517,527,543,887,901,
	1174,1190,1251,1255
compared with composi-	
tion of navy bean....	1232
effect of date of	
planting on.....	661
effect of storage on.....	4d
literature reviewed.....	1320
relation to fertilizer	
treatment.....	443
relation to geographical	
location.....	443
relation to soil type....	443
relation to variety	
characteristics.....	443

<u>Item</u>	
Soybeans - Continued	
composition - continued	
South Africa.....	270
various stages of maturity	347
means of determining	
proper time to	
harvest, Missouri....	380
conditioning the crop.....	398
conference	
Clarksville, Texas.....	236
Corsicana, Texas.....	162
Missouri.....	287
Connecticut agricultural	
experiment station.....	525
constituents	
effect of heat upon.....	1233
valuable to industry.....	557
consumption.....	144,457,459
for various uses.....	540
growth, world.....	220
international.....	476
contracting.....	400
American Milling Co.,	
and allied interests	
and Illinois farmers....	402
contracts between growers	
and producers will be	
of short duration.....	407
factor in rapid develop-	
ment of the industry....	406
guarantees soybean grower	
a definite price,	
Archer-Daniels-Midland	
Co., Minneapolis,	
Minn.....	400
large scale, Illinois.....	417
milling companies and	
elevators.....	412
Connecticut.....	786
cooperation needed between	
farmer and processor.....	581
Corn Belt.....	283,288-289,
	386,836,1105
Cotton Belt.....	535
could make corn belt inde-	
pendent of limited amount	
and high prices.....	921

<u>Item</u>	
Soybeans - Continued	
crisis facing growers.....	4c
crop conditions.....	462-464
crop records broken in	
drought year.....	227
crushed..	81,460-461,466,470-471
by-products, defined,	
National soybean oil	
manufacturers associa-	
tion.....	720
costs, factors affect-	
ing.....	715
crushing plant, cooperative,	
Piatt County, Ill.....	69
from standpoint of	
millmen and farmers,	
North Carolina.....	292
industry, history.....	618
products secured from,	
North Carolina.....	292
<u>See also</u> Soybean oil; etc.	
cultivation <u>See</u> Soybeans,	
production	
dealers instructions for	
appeal procedure.....	340
demand.....	552
as high protein feed,	
constant.....	19
European.....	411
for human consumption,	
increase.....	114
for industry.....	25
constant.....	19
greater than supply,	
Indiana.....	9
increasing.....	280
deodorizing, blowing with	
hot air, directions.....	1182
derivatives, utilization....	300
description.....	16,68,265
destined to become major	
field crop.....	164
destined to become staple	
as oats.....	149
disembittering and improving,	
process, patent.....	1609
displacement of overproduction	
of other crops, possible	
tendency.....	224



<u>Item</u>	
Soybeans - Continued	
distribution.....4	
world.....167	
diversify markets for farm	
products.....616	
drought resistance.....68	
dry and green, found in	
markets of large cities...1232	
drying.....485	
East Texas.....236	
Eastern States.....4	
economic status <u>See</u> Soybeans,	
importance of crop	
effect on corn production,	
central and southern	
Louisiana.....748	
effect on dairy products.....962	
effect on soil....4e,34,38,76,85,	
89-90,120,153,188,203,207,	
209,252-253,275,284,292-	
294,299,306,504,514,520,	
534-535,565,649,724,728,	
743,746,749-760,764,767,	
769,773,776,780,783,787,	
790-791,798,800-801,805,	
808,810,813,817,823-824,	
828-829,831,839,843,846,	
848,853-854,867	
acid soils.....846	
Arkansas.....24	
compared with clover.....126	
Connecticut.....22	
eastern North Carolina.....562	
Illinois.....44	
Indiana.....4	
lands too poor for corn,	
produce fair crop of	
soybeans, Kansas.....303	
Louisiana.....748	
low wet lands, Yazoo-	
Mississippi Delta.....799	
Mississippi.....741,1036	
New Jersey.....40	
Southern States.....214	
worn-out cotton lands,	
Texas.....46	

<u>Item</u>	
Soybeans - Continued	
effect on succeeding	
crop.....4e,767	
depressing.....841	
effect on U. S. cottonseed	
and linseed export markets,	
probable.....219	
effect on yield of	
wheat, Missouri.....122	
emergency crop.....216,253,777	
for food crisis.....778	
emulsifying, directions....1182	
enzymes.....1298,1375	
erosion of land.....769	
Europe.....194	
exhibit	
Chicago World's Fair.....522	
from Minnesota at	
International Live	
Stock Hay and Grain	
Show, Chicago.....31	
Pennsylvania Rail-	
road.....4e,548	
experiences of farmers	
with.....139,155,315,756,796	
Adams County, Ill.....827	
Iowa.....99	
New Jersey.....52	
related at first	
annual soybean day,	
Clark County,	
South Dakota.....109	
Wapello Co., Iowa.....291	
<u>See also</u> Soybeans,	
production	
experimental crop,	
Northern States.....304	
exploitation, chart.....522	
exports.....81,114,130,141,175,	
328,450,452,457,470-471	
Japan to U. S.....263	
Manchuria.....451	
to Asia and Europe....130	
net sum total over	
imports.....452	
U. S., will not be able	
to compete with Man-	
choukuo supply for	
some years.....411	

<u>Item</u>	
Soybeans - Continued	
exports - continued	
various countries.....	130,450, 454,503,1218
extent to which Far Eastern	
beans compete with	
American cotton-seed	
products in European	
market.....	264
extent to which profitably	
fitted into general	
farming plan, Indiana.....	326
"extra dividend" in	
agriculture.....	249
factor in grain and feed	
trade.....	179
factors making them	
popular, Pennsylvania.....	269
factors needed to make	
success of the crop.....	213
fat content <u>See</u> Soybeans,	
oil content	
fatty acids	
calcium salt, distillation,	
in preparation of	
liquid fuel resembling	
petroleum.....	610
physical constants.....	445
faults.....	38
fertility value <u>See</u> Soybeans,	
effect on soil	
fertilizer	
requirement, least	
expensive.....	824
tests.....	860
treatment in relation to	
composition.....	443
firms selling.....	538
first step in well-balanced	
farm system sandy-land	
areas of northern Indiana	
and southern Michigan.....	768
food research institute,	
proposed.....	1255
form axis of struggle for	
dominance in Manchuria.....	200
foundation, proposed, for	
creation of national soy-	
bean food research in-	
stitute.....	1255

<u>Item</u>	
Soybeans - Continued	
free fatty acid content,	
determination.....	425
freight rate and privilege	
schedules, should have	
full privileges of	
grain.....	179
from financial and soil	
fertility standpoints....	149
genetics.....	40
grading and standardiza-	
tion.....	168,208,228,249, 404,490
definition of	
standards.....	404
development of.....	4
Kansas.....	404
Minnesota Boards of	
grain appeals.....	332
promulgated.....	329
rules, change, in-	
vestigated by	
Soybean committee	
of Grain and feed	
dealers national	
association.....	333
transfer from Hay,	
feed and seed divi-	
sion to Grain divi-	
sion of U. S. Bureau	
of agricultural	
economics considered	
by Soybean committee	
of Grain and feed	
dealers national	
association.....	333
under Grain Standards	
act, would require	
an amendment to	
the Act.....	336
uniform, give basis	
for price quota-	
tions.....	329
United States.....	4,328, 339,404,414
charge, compared with	
grains, investigated	
by Soybean committee	
of Grain and feed	
dealers national	
association.....	333



<u>Item</u>	
Soybeans - Continued	
grading and standardiza-	
tion - continued	
United States - continued	
definitions.....	339
inadvisability of	
including oil	
and protein con-	
tent analyses	
in.....	441
suggested changes....	328
tentative.....	334
practicability	
tested.....	342
grinding	
directions.....	1182
methods.....	762
mill, patent.....	1512
ground	
composition and	
digestibility.....	284
decolorization of	
carotene, effect on	
vitamin A potency.....	1221
protein content, high.....	1002
grower	
and oil mill, relation	
between.....	4
contracts, with processors,	
will be of short	
duration.....	407
must not expect ever-	
expanding market.....	217
netted substantial advance	
over previous prices	
through contracts,	
Illinois.....	417
growing season, length	
considered in determining	
best varieties for	
New York.....	285
growth habit considered, in	
determining best varieties	
for New York.....	285
Gulf-to-Canada sweep.....	33
habits, compared with	
lima beans.....	190
Hahto, lima bean substitute...	190

<u>Item</u>	
Soybeans - Continued	
handling.....	55,168,234,274,
	284,398,412
by elevator men.....	403
by wholesale and retail	
seedsmen.....	473
cooperative, Illinois.....	395
ease.....	791
Eastern States.....	59
elevator proposition.....	407
Johnson Seed farms,	
Stryker, Ohio.....	106
methods.....	369
eastern Kansas.....	129
Meharry Farm, Champaign,	
Ill.....	278
most profitable.....	302
Southern States.....	214
proper, in storage,	
suggested.....	274
through terminal	
elevators.....	328
harvesting...4e,11,21-22,26,29,	
34-35,38,52,64,76,78-79,	
85,89,96,100,103,105,119-	
121,128,132,139,149,158-	
159,166,180,182,192,197,	
199,228,234,239,242,244,	
247,250,252-253,256-258,	
261,271-272,277,281-282,	
284,293-294,297,301,305,	
372,385,391,774,801,819,	
821,847,853,887-888,943,	
951,961	
Alabama.....	343
Arkansas.....	24
Black Hawk County, Iowa...	23
C. B. Newton.....	397
Canada.....	142
Champaign, Illinois.....	83
charges per acre,	
different methods,	
Illinois.....	376
China.....	263
Corn Belt.....	386
costs.....	378,933
cut.....	383

<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
harvesting - continued	harvesting - continued
costs - continued	machinery - continued
Illinois.....4b	combine - continued
Kansas.....113,303	savings affected...364
cutting methods....352,360-361	Illinois.....364
difficulties, cause of	Southern States....350
slow growth of industry 185	Virginia.....356
Eastern States.....59	efficient, increase
experience of M. P. L.	value of crop,
Mark of Franklin Co.,	for food and
Ohio.....178	forage.....381
experiments, results.....940	six types, questions
factors affecting.....378	and answers concern-
for hay See Soybean hay,	ing.....375
harvesting	maturity, affects
Illinois.....44,84,86	characteristics.....440
Iowa.....94,151-152	methods...15,68,123,145-146,
Johnson Seed farms,	148,154,161,168,177,
Stryker, Ohio.....106	196,198,209-210,255,
Kentucky.....124	289,296,352,354,362,
labor, reduced by	368-369,373,378,381,
machinery, Illinois.....379	649,753,762,794,810,
machinery.....4b,161,366,369,	812,817,831,833,835,
372-373,375,378,392	854,862
binder and grain	broadcast harvester,
separator more ex-	Virginia.....356
pensive than with	cheaper being worked
combine, Illinois....383	out.....349
combine.....4,4a,	Colorado.....204
101,185,274,377	dependence upon hog
advantages.....359,367	market outlook.....83
Corn Belt.....376	effect on yields
costs.....359,377	and costs,
Illinois.....325	Illinois.....323
reduced.....367	Illinois.....376
cuts threshing loss..366	important.....345
description.....371,374	Indiana.....10
Illinois.....364,383	Kansas.....113,797
Mississippi Delta....355	Virginia.....356
Raymond Warren farm,	Missouri.....122
Wapello Co.,	New Jersey.....40
Iowa.....384	North Carolina.....292
reduces losses.....359	Pennsylvania.....53
results in higher	problems.....879
quality product...367	rate.....378
saves more beans.....367	studies.....4e



<u>Item</u>	
Soybeans - Continued	
harvesting - continued	
time.....	373,390,825,880
Colorado.....	204
important....	345
influences protein	
content of hay.....	940
irregularity, Missouri..	380
reduced by machinery,	
Illinois.....	379
test, Wooster, Ohio.....	253
to secure lowest	
moisture content	
suggested.....	274
waste.....	378
West Virginia.....	37,57
with grain binder,	
suggested.....	387
Hawaii.....	206
hindered by drought and	
rabbits, western	
Kansas.....	303
history....	2,7,13,17-18,35,41,43,
68,78,88,90,96,103,115,117,	
123,130,135,153-154,160,	
167,170,174,193,203,205,	
207,210,212,219-221,228,	
234,241,248,271,273,281,	
300,504,524,635,847,887,	
1231,1255	
agricultural.....	192-193
France.....	1200
Illinois.....	163
Manchuria.....	169
United States.....	74,150,
163,186,195	
various countries.....	16,
100,125,551	
world.....	293
hogged down.....	25,68,81,815,
828,867,912,917,1041,1054,	
1056-1057,1077	
by States.....	240
Corn Belt.....	217
Delaware.....	1064
effect on hardness of	
fat produced.....	1054,1056

<u>Item</u>	
Soybeans - Continued	
hogged down - continued	
Otootan compared	
with Biloxi.....	1054
saves harvesting costs,	
Kansas.....	303
with corn.....	126,802,
1042,1086,1095,1119	
Carroll County, Mo....	1072
costs.....	1038
Fayette County,	
Indiana.....	1081
Kansas.....	797
Kentucky.....	313
less effective than	
tankage.....	1095
Louisiana.....	314
with sweet potatoes,	
Louisiana.....	314
See also Soybean forage;	
Soybeans, uses, farm,	
as feed	
honey plant, should not	
be ranked as.....	530
hydrocarbon content,	
compared with other	
food products.....	1353
Illinois.....	44,72,278,716
importance of crop.....	42,103,
118,128,159,170,186,222,	
250,415,491,506,596,822,	
883,1178a	
advanced from minor to	
major importance.....	171
as source of cheap	
nitrogen.....	837
as source of oil.....	512
as source of oil, food	
products and	
fertilizer.....	194
economic.....	51,97,1053
effected through	
drought.....	907
events contributing.....	600
Far East.....	263
financial.....	306
future revealed by	
experiments,	
Oklahoma.....	186

Item

Soybeans - Continued

importance of crop - continued  
in cropping system,  
Ilanoka farm, Iowa.....804  
in light-soil farming,  
Wisconsin.....747  
in rotation system, Corn  
Belt.....808  
in world economy.....146  
increasing.....31,33,105,  
123,166,192,195,200,233,  
268,600  
Corn Belt.....830  
Ontario.....31  
Pennsylvania.....133  
industrial.....186,528,597  
Iowa.....94  
Kentucky.....124  
Manchuria.....212  
Midwest.....419  
Oklahoma.....121,161  
South Dakota.....65  
various countries.....138  
West Virginia.....57  
Wisconsin.....160  
world.....300,406  
imports.....25,49,80-81,  
130,141,164,265,450,452,  
457,470-471  
chief importing  
countries.....450-451  
excess over exports.....452  
for consumption.....477  
from Manchuria  
by soap factories.....702  
possibilities for use  
in American mills....262  
from Orient, value.....295  
surplus.....4c  
various countries.....130,1218  
in world economy.....130  
income from  
cash  
by States.....462  
northern Wisconsin.....76  
per acre, northern  
Wisconsin.....76  
See also Soybeans, pro-  
duction, profits and  
returns

Item

Soybeans - Continued

increase farm efficiency...1048  
Indiana.....4,10,63,282,348,966  
industry  
avoidance of mushroom  
growth essential.....102  
controlled by Japan.....23  
development and progress..3,  
8,54,81,569,618,1306  
due to A. E.  
Staley.....717  
hampered by harvesting  
difficulties and  
lack of commercial  
market for the  
beans.....185  
needs for.....575  
part played by seeds-  
men in.....8  
rapid.....179  
due in part to  
contract  
buying.....406  
origin, United States,  
due to A. E.  
Staley.....717  
success, United States,  
due to A. E.  
Staley.....717  
tariff protection,  
need for.....54  
United States, effect  
on Malayan copra  
and palm oil trade.....82  
See also Soybeans  
infection, fungus and  
bacterial, treated  
with SO<sub>2</sub>.....485  
influence on gastric  
secretion, in dogs.....1376  
influence upon wheat  
crop.....805  
inoculation.....824  
adds fertility to  
soil, eastern  
Kansas.....129  
field trials, New  
Hampshire Agricultural  
experiment station....198



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
inoculation - continued	invasion of U. S. into world
improved crop.....889	market for, effect
methods, more efficient	upon Japan.....98
must be found.....894	iodine content,
insect pests <u>See</u> Soybeans,	fluctuations.....433
pests and diseases	Iowa.....94,99,151
inspection.....330	iron content.....1310
appeal.....339	Ito San, yields, Fort
development.....223	Collins, Colo.....204
federal.....339,341	Japan.....194,1284
appeals, procedure.....340	Kansas.....250,303,797
certificates.....339	Kentucky.....124,792
Chicago inspectors.....330	labor-saving crop.....306
methods.....339	Laredo.....91
federal-state.....339	feeding trials for pork
fees and charges.....339	production.....1036
for export, statistics.....341	Marshall County, Tenn.....91
interior markets,	leaves, oil, ether ex-
statistics.....341	traction method and
procedure.....427	uses in paint
qualifications of	manufacture.....695
inspectors.....339	limitations as pasture.....805
receiver of certificates...339	list of unpublished theses
rules, Kansas.....404	concerning.....251
service, U. S. Bureau of	longevity affected by
agricultural economics..328,	threshing injury and
337	storage conditions.....486
to remain separate from	Louisiana.....473
Grain grades act.....336	lower price of dairying
intentions to plant.....260,462	mill feeds.....873
interest in	Maine.....301
increasing.....700	major crop.....175,602
Illinois.....86	make good in United
reasons.....835	States.....210
shown by industry.....30	make North independent of
introduction into	southern oilmeal.....873
Europe, effect upon U. S.	Manchuria.....28,130,169,
cottonseed and linseed	194,220,547,1256
export markets.....219	cheapness may force cotton
Illinois.....228	farmer of U. S. to
permanent cropping	find another substitute
schedule, merited.....842	for cotton.....188
United States..21,228,269,1365	consumption, United
invasion of Corn Belt.....217	States.....28
invasion of cotton lands.....210	find Asiatic and
	European markets.....246

<u>Item</u>	
Soybeans - Continued	
Manchuria - continued	
possibility of imports	
for American	
mills.....	262
U. S. small purchaser of...	246
marketing....	141,168,199,223,228,
	275-276,329,398,406
and supply data.....	245
by mail, method of C. B.	
Newton.....	397
cooperative.....	4a,414
Illinois.....	395
need for spreading	
surplus control	
over each unit of	
the commodity that is	
benefited.....	419
objective of Soybean	
marketing associa-	
tion.....	406
future trading.....	393
improvements in relation	
to their economic	
characteristics.....	245
Iowa.....	152
methods.....	245,249
Linn Co., Mo., Soybean	
growers' associa-	
tion.....	394
on basis U. S. standards...	328
on world market.....	405
proper, adds to cash	
income of farmer.....	9
rapid growth, Chicago.....	330
supply and demand basis,	
suggested.....	407
use of tentative grades	
in.....	334
markets.....	4a,63,107,147,245
cottonseed plants,	
Southern States.....	213
ever-expanding, must not	
be expected by growers..	217
export, development,	
possible.....	411

<u>Item</u>	
Soybeans - Continued	
markets - continued	
futures.....	42
at opening of future	
trading market on	
Chicago Board of	
trade.....	393,408
Chicago.....	416
desirability studied,	
by Chicago Board	
of Trade.....	396
establishment considered	
by Soybean committee	
of Grain and feed	
dealers national	
association.....	333
may be established	
by Chicago Board	
of trade.....	415
industrial field,	
increased.....	616
lack of, cause of slow	
growth of industry....	185
largest in world,	
Southern States.....	213
on firm basis.....	410
potential.....	141,245
use as paint in-	
gredient.....	725
protection.....	4d
satisfactory, depends	
upon consumption of	
soybean oilmeal in	
livestock feeding ....	932
sought.....	264
stimulated by soybean	
mills, Iowa.....	56
wider, expected to follow	
establishment of	
soybean research	
laboratory at	
University of	
Illinois.....	590
world.....	413
and United States...	4d,81
Marshall County, Tenn.....	91
Massachusetts.....	863



<u>Item</u>	
Soybeans - Continued	
maturity, effect of date of planting upon.....	661
may assist in relieving unemployment.....	92
may make farming a paying proposition.....	92
meal content.....	73
merits should be recognized..	1398
Michigan.....	258, 532
Middle West.....	54
<u>See also</u> Soybeans, Corn Belt	
mineral content.....	1183
deficiencies.....	1101
Minnesota.....	5
Mississippi.....	473
Mississippi Delta.....	4
Missouri.....	111, 122
mistakes with.....	155
moisture content	
affects viability of seed.....	489
determination..	425, 429, 431, 736
Brown-Duvel moisture tester.....	421
by electric moisture tester.....	421
Tag-Heppenstall moisture meter.....	423
effect on quality of expressed oil.....	711
moved up from feed lot to paint factory and kitchen.....	630
movement.....	464, 473
by States.....	462, 464
from farms, expedited by basis for price quotations.....	329
from first hands.....	473
native, purchase urged.....	259
natural history.....	58
New Hampshire.....	198
New Jersey.....	272, 304, 318, 963
New York.....	849
nitrogen content, richest of all grains.....	764

<u>Item</u>	
Soybeans - Continued	
North Carolina....	4, 90, 293, 295, 473, 562, 565, 801
northeastern.....	214
Northeastern States.....	849
Northern States.....	812
not a wonder crop.....	827
nutritive value <u>See</u> Soybeans, uses, food; Soybeans, uses, farm, as feed	
Ohio.....	253, 296, 744-745, 829
oil content.....	428, 440, 445, 661, 1208
affected by variety, soil type, and kind of fertilization.....	440
affects viability of seed.....	489
character and bearing on nutrition.....	1183
compared with other food products.....	1353
determination.....	420, 425, 736, 828
extraction with petroleum ether....	436
importance in production and marketing.....	444
inadvisability of including in official U. S. standards.....	441
modified optical method of Wesson.....	424
Soxhlet method.....	420
environmental factors affecting.....	443
fluctuations.....	433
high.....	532
compared with other crops.....	506
importance and value in dairy ration.....	956
importance in evaluating.....	441
investigations, reviewed.....	1290

Item

Item

Soybeans - Continued

oil content - continued	
Oklahoma.....	446
range.....	439, 444
reduction method, patent..	1486
surveys, benefit to	
grain industry.....	444
See also Soybean oil	
Oklahoma.....	186
on land not subject to	
erosion or blowing,	
Iowa.....	750
on sandbar land.....	127
on sandy soils, preferability	
to cowpeas.....	807
Ontario.....	242
organic nutrients.....	1310
Oriental	
opportunities for U. S.	
to import.....	188
ungraded.....	259
origin.....	18, 135, 297, 1332
outlook for.....	4, 4a, 74, 78, 199,
	228, 260, 406, 464, 528, 569
charts.....	466-468
Corn Belt.....	283, 923
favorable.....	157
in industry.....	569
Indiana.....	8, 189
last part of 1937,	
unfavorable.....	260
Manchuria.....	246
Minnesota.....	616
Ohio.....	178
overproduction.....	4c
oxidation prevention,	
process, patent.....	1421
pasture See Soybean forage	
pay better than oats,	
Wapello County, Iowa.....	291
Pennsylvania.....	53, 133,
	182-183, 455, 815
pentosan content, determina-	
tion.....	1196
pests and diseases.....	4b, 192,
	202, 221, 854
various countries.....	125

Soybeans - Continued

Philippine, composition.....	508
phosphatides See Soybean	
phosphatides	
phosphorous	
compounds.....	652, 1310
content, determination...	432
place	
in agriculture.....	4, 16, 80,
	178, 233, 254, 284, 504,
	786, 816, 1090
Connecticut.....	22
Corn Belt.....	323, 754
Cotton Belt.....	214
due to boll	
weevil.....	188
Iowa.....	251
New York State.....	284
northeastern States...	849
Ohio.....	296
on every farm.....	756
Pennsylvania.....	209
Tennessee.....	156
various countries..	16, 270
in Chinese economy.....	1165
in modern industries.....	200
in world economy.....	248
in world trade.....	248
on European market.....	501
plans, adjustment to changes	
in prices and cost of	
production, Iowa.....	151
plant	
composition.....	347
differences with	
increasing	
maturity.....	841
measured by chemical	
means.....	739
deficient in essential	
elements feeding	
value decreased.....	860
life history.....	347
uses.....	1214
See also Soybeans, botany	
planting.....	774
after rye, New Jersey....	181



<u>Item</u>	
Soybeans - Continued	
planting - continued	
experiments, Delta	
Experiment Station,	
Miss.....	6
for oil and meal, larger...	401
larger, needed, Arkansas...	140
late.....	778
map.....	240
tests, Kansas.....	39
time and labor, reduced	
by tillage machinery,	
Illinois.....	379
plowing, efficient, insured	
by machinery, Illinois.....	379
poor-land crop, good.....	757
popularity	
built by progressive farmers	
in, Illinois and	
Indiana.....	776
increasing.....	67
Corn Belt.....	289
Illinois.....	235
permanence of.....	147
reasons for.....	773
Illinois.....	27
Missouri.....	64
<u>See also</u> Soybeans, importance	
of crop	
possibilities of.....	170, 602, 823
as an oil seed.....	724
Brazil.....	51
commercial.....	141, 268
Indiana.....	189
Texas.....	46
demonstration, Johnson	
feed farms, Williams	
Co., Ohio.....	137
East Texas.....	236
economic.....	537
far-reaching.....	192
financial.....	45
for corn belt farmers.....	143
for farm relief without	
subsidy.....	544
Italy.....	507
Nebraska.....	247

<u>Item</u>	
Soybeans - Continued	
possibilities of - continued	
New York.....	849
Northeastern States.....	849
Western Canada.....	138
<u>See also</u> Soybeans, outlook	
praise, unentitled, should	
not be given.....	526
preparation for market.....	274
preservation, patent.....	1413
prices.....	4c, 19, 107-108, 115,
406, 461, 464, 473-474, 696,	
1174	
advance improbable	
unless Manchurian	
supplies cut off.....	410
affected by events in	
Manchuria.....	144
at which should be pur-	
chased for profit	
in the oil industry...	697
basis essential.....	329
by States.....	462-464
by States or districts...	469
changes.....	476
and changes in cost	
of production,	
adjustment of soy-	
bean plans to.....	151
statistics.....	476
compared with cottonseed	
and corn oil prices...	733
Corn Belt.....	283
dependent upon market	
for meal.....	73
dependent upon outlet	
for industrial	
purposes.....	569
expected, Western	
Canada.....	138
export, lower than	
price of Manchoukuo	
product.....	98
factors affecting.....	81
Iowa.....	152
farm.....	81, 461-466
by States.....	464
leading States.....	5

<u>Item</u>	
Soybeans - Continued	
prices - continued	
guaranteed, under con-	
tracting, Illinois..	402,417
high	
cause mill to operate	
at one-half	
capacity.....	683
reasons for.....	260
higher in European than	
in domestic market.....	62
influence of varicus	
factors on.....	245
low.....	1391
effect on domestic oil	
milling industry.....	62
Manchoukuo, U. S.	
can not compete with	
for some years.....	411
minimum guaranteed to	
farmers by industries,	
Illinois.....	627
paid by oil mills..	292,563-564
sale.....	97
spread between farm	
price and total value....	81
stability.....	410
United Kingdom.....	450
uses now discovered,	
cause for higher.....	925
processing.....	3,4d,49,251,
	575,656,729,1183,1253
costs.....	279
facilities comparable to	
other regions,	
Minnesota.....	616
hazards.....	703
improvements	
avoid bean-flavored	
product.....	1245
enhance keeping	
quality.....	1245
provide high-protein,	
fat-rich, low-	
carbohydrate flour..	1245
industry, growth.....	7
may be done by South's	
cottonseed and peanut	
crushing plants.....	492

<u>Item</u>	
Soybeans - Continued	
processing - continued	
methods.....	73,406,587,
	607,729,869
effect upon nutritive	
value of meal.....	4d
need for, Iowa.....	152
objectives for manufacture	
of edible flour.....	1250
plants	
Centerville, Iowa.....	640
design.....	251,700
dust explosion in,	
prevention.....	4d
explosion, Glidden	
Co., Chicago, Ill..	703
Iowa.....	56
near capacity operation,	
through contracts,	
Illinois.....	417
operating one-half	
capacity, due to	
high bean prices...	683
Portsmouth, Va.....	229
production capacity....	50
Ralph Wells & co.,	
Monmouth, Ill.....	641
utilization of beans	
increased.....	564
processors	
contracts	
with elevators.....	412
with growers,	
will be of short	
duration.....	407
instruction for	
appeal procedure...	340
unit, simple, available	
to farmers.....	594
See also Soybean oil,	
extraction	
production.....	2-3,5,11,20-21,
	25-27,42,49,55,80-81,97,100,
	103,114-115,128,130-131,135,
	141,146,149,150,153,155,158,
	169,174,201,218,220-221,223,
	227,234,257,265,268,281,285,
	288,300,392,406-407,447-448,
	457,460-462,465-466,472,475,
	477,506,509,518,708,784,809,
	813,887,890,943,961,1174,1183



Item

Soybeans - Continued  
production - continued  
advisability,  
Massachusetts.....75  
applications of limestone  
to soil essential.....894  
by States..240,462-463,472,475  
California.....232  
Champaign County, Ill.....237  
chief producing coun-  
tries.....130,451-452  
compared with  
Manchuria.....405  
chief producing States 130,475  
China.....263.  
commercial  
encouraged by handling  
by elevator men.....403  
Iowa.....152  
compared with corn.....874  
cooperative.....4a  
Corn Belt.....9  
costs.....38,254,281,311,  
315,406,497,993,1052,  
1331-1332  
accounts, Champaign  
and Piatt Counties,  
Ill.....322  
American,compare favor-  
ably with Manchurian  
costs.....246  
Cass, Carroll, Howard  
and Miami Counties,  
Indiana.....327  
changes.....4e  
and price changes,  
adjustment of  
soybean plans to..151  
Craven County, N. C.....309  
definition.....4e  
demonstration by  
Herman Hughel.....306  
effect on different  
practices in growing  
and harvesting,  
Illinois.....323  
equipment as element in..4e

Item

Soybeans - Continued  
production - continued  
costs - continued  
fertilizer as  
element.....4e  
future trends.....4e  
higher than for  
clover.....307  
Illinois.....4b,323,325  
Indiana.....310,326  
Kansas.....113  
labor  
as element of cost  
of production....4e  
Indiana.....326  
Louisiana.....319  
Ohio.....321  
Los Baños, P. I.....324  
Louisiana.....319  
Manchuria, low compared  
with U. S.....188  
Missouri.....122,311-312  
net.....97  
New Jersey.....181,304  
New Jersey Agricultural  
experiment  
station.....317-318  
North Carolina....292,309  
reduced will provide  
cheaper home-  
grown concentrates  
and more economical  
production of  
farm animals.....814  
crushing purposes, ex-  
pansion, depends upon  
extent oil and meal  
can meet competition  
with similar products  
already in field.....865  
Cuba.....534  
Czechoslovakia.....241  
decrease, Manchoukuo.....98  
Delaware.....1147  
Delta experiment station,  
Stoneville, Miss.....112  
dry land, Montana.....196

<u>Item</u>	
Soybeans - Continued	
production - continued	
easier than other	
legumes.....	923
Eastern States.....	59
effect on Manchurian	
trade.....	246
encouraged by prices	
attractive to growers...	569
England.....	504
essential points in.....	455
estimates.....	177
Far East.....	264
for milling purposes.....	401
for oil and meal,	
profitability, Corn	
Belt.....	164
for oil markets, possibilities,	
from manufacturer's	
viewpoint.....	287
for oil mills.....	4
greater than cowpea	
production.....	755
historical development,	
various States.....	300
Idaho.....	96
Illinois.....	9, 84, 86, 150
increase.....	22, 25, 30, 85, 98,
171, 195, 227, 249, 430, 522,	
561, 566, 569, 591, 1092	
China.....	263
due to industrial and	
food value.....	492
effect upon Manchurian	
trade.....	451
great, possible.....	246
Iowa.....	867
and other states.....	67
possibilities of be-	
coming burdensome....	224
possibility of competi-	
tion with Manchurian	
crop.....	246
rapid.....	107
reasons for.....	85
Indiana.....	9, 326
Iowa.....	783
principal producing	
counties.....	141

<u>Item</u>	
Soybeans - Continued	
production - continued	
irrigated land	
Colorado.....	204
Montana.....	196
Japan.....	263
Kansas.....	303
keeps money used for	
imports, at home.....	140
labor requirements...160, 305	
competition with	
corn.....	915
Craven County, N. C....	309
Delta Experiment	
Station, Miss.....	6
horse.....	311
literature reviewed....	1320
Louisiana.....	795, 800
Manchuria.....	246
compared with other	
countries.....	405
competition with	
U. S.....	188, 224, 411
map.....	466
mechanization.....	101, 320
Louisiana.....	319
makes costs compare	
favorably with	
Manchurian costs...	246
methods.....	88, 159, 167,
198, 299, 545, 548, 835	
changes.....	4e
Illinois.....	86, 323, 825
improvement, Iowa.....	152
Indiana.....	310, 326
Iowa.....	99
level row.....	381
Missouri.....	64
need for improvement,	
Iowa.....	152
New Jersey.....	304
North Carolina.....	292
power, needed.....	305
ridged-row.....	381
south Mississippi.....	71
various countries.....	18
Minnesota.....	616
Montana.....	196



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
production - continued	production - continued
New Hampshire Agricultural experiment station.....198	profits and returns - cont'd
North Carolina.....292,295	possible.....3
not new.....269	Texas.....46
Ohio.....296	where alfalfa and
on acid soils.....808	clover cannot be
Kansas.....303	grown.....746
on contract, for use in	provides better feed.....843
commercial feeds.....185	reasons for.....4a,216
opens up new sources of	New Jersey.....40
plant-food in soil.....843	reduces soil nitrates....766
Pennsylvania.....183	regions
possibilities of justifica-	Czechoslovakia.....241
tion by industrial ab-	highest, Illinois.....395
sorption.....224	northern, exploration
profits and returns.....89,	needed for new
147,155,280,315,931	varieties.....849
compared with cowpeas,	risk, no more than in
south Mississippi.....71	raising corn or
Delta Experiment	wheat.....255
Station, Miss.....6	short season.....216
demonstration by Herman	small before 1898.....175
Hughel.....306	South Dakota.....13
eastern Kansas.....129	southern Minnesota.....781
equitable, insured by	Southern States.....214
basis for price	stimulated by recog-
quotations.....329	nition of value of
expected.....887	hay, pasture, seed
higher than for oats....414	and oilmeal.....814
increased	Tennessee.....1004
by machines,	Texas.....102
Illinois.....379	thin land.....763
through improvement	time element in, Iowa....151
in cultural	to meet grading
methods, Iowa.....152	standards:.....4c
Indiana.....189,310,326	tonnage gathered.....466
4 counties.....327	trends.....172,207,418
Iowa.....783	under adverse condi-
Kansas.....38-39	tions:.....108
Missouri.....312	urged
net cash, conditions	Southern States.....1258
to be met for.....9	to meet demand for
New Jersey.....317-318	increased food
Piedmont section,	production,
Georgia.....279	Ohio.....1331
	various countries.....17-18,
	81,97,125,130,220,264,
	454,503..

<u>Item</u>	
Soybeans - Continued	
production - continued	
various countries - continued	
competition with	
U. S.....	224
various farms.....	751
will grow anywhere corn	
grows.....	874
world.....	5,167,215,248,461
and soybeans in U. S.....	4d
<u>See also</u> Soybeans,	
statistics; Soybeans,	
experiences of farmers	
with	
projects, State agricultural	
experiment stations.....	243
prospects <u>See</u> Soybeans,	
outlook	
protein	
chemical analysis.....	49
content.....	49,58,95,301,
445,527,532,661,783,893,	
956,1191,1208	
analyses, inadvisability	
of including in	
official U. S.	
standards.....	441
biological value.....	1263
character, and bearing	
on nutrition.....	1183
Corn Belt.....	874,921
factors affecting...434-435	
calcium and	
nitrogen.....	426
environmental.....	443
fertilizer treat-	
ment.....	434
thickness of	
planting.....	434
time of harvesting...434	
variety, soil type	
and kind of	
fertilization.....	440
fluctuations, great.....	433
high.....	954
compared with other	
crops.....	506,764,1310
Kansas.....	303

<u>Item</u>	
Soybeans - Continued	
protein - continued	
content - continued	
importance in	
evaluating.....	441
investigations,	
reviewed.....	1290
Oklahoma.....	446
range.....	439
crude	
chemical studies.....	427
extraction.....	620
food value, effect of	
cystine and casein	
supplements on....	1233
cystine deficiency.....	1311
decomposition and decompo-	
sition products, by	
hydrolysis.....	437
deficiency.....	930
digestibility.....	296,1053
coefficient.....	934,1264
effect of heating on.....	208
beneficial.....	1233
embodied by compositions	
of matter, reduction	
of water requirement,	
process, patent.....	1442
extract, soluble, prepa-	
ration and use.....	1401
extraction.....	208
by alkalies.....	679
methods.....	624,1214
research, Japan.....	208
properties.....	437,588
reactivities with	
formaldehyde.....	588
solubility	
in calcium thiocyanate	
solution.....	588
influence of treat-	
ments on.....	588
soluble, extraction,	
patent.....	1604
substances, manufacture,	
process, patent.....	1570-
	1571



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
protein - continued	salient facts concerning....114
<u>See also</u> Protein; Soybean	salt composition.....1263
cephalin; Soybean	seed bed preparation,
glycinin; Soybean	efficient insured by
lecithin; Soybean meal;	machinery, Illinois.....379
Soybean oilmeal	seeding, cost, considered
quality improvement, under	in determining best
mixed storage system,	varieties for New
South Manchuria Rail-	York.....285
way Co.....484	sheep-raising sections
quantity bought for a	of western Virginia.....787
dollar, compared with	shipments.....473
canned salmon, veal	by States....463-464,469,473
cutlets, (round) beef,	ease of.....1220
navy beans, (smoked)	instructions for appeal
ham, (fresh) ham, eggs,	procedure.....340
(uncooked) corn meal,	shrinkage.....4b
wheat flour, rice,	size, compared with size
(skimmed) milk, (un-	of lima bean.....190
skimmed) milk, and	soil and climate require-
potatoes.....296	ments.....26,68
questionnaire sent to	soils favorable to
growers by Ohio Agricul-	growth.....290
tural Experiment Station...254	solution to corn acreage
questions and answers..35,111,147	reduction problem.....199
race with corn and wheat,	solution to food and
close.....528	population problem,
reasons for planting.....20	Philippine Islands.....1201
recognition.....212	solve problem of rearrang-
Germany.....212	ing crops to provide
India.....212	more legumes.....754
research	solvents.....539
American scientists.....1231	South Dakota.....65,109-110
Edison institute,	south Georgia.....4
Dearborn, Mich.....559	south Mississippi.....71
University of Illinois	statistics.....25,50,80
laboratory.....4d,4e,54,	stocks <u>See</u> Soybeans, supply
207,231,492,570,589,590-	storage.....101,103,120,
592,600,605,691,707,719	166,192,197,485,535
roots.....253,347	ease of.....1220
sales.....473	effect.....4d
facilitated, under mixed	on longevity of
storage system, South	bean.....486
Manchuria Railway Co....484	on yield and speed of
<u>See also</u> Soybeans,	extraction of oil
marketing	and phosphatides...479

<u>Item</u>	
Soybeans - Continued	
storage - continued	
heat and moisture régime...	485
Iowa.....	152
on farm and selling to	
meet manufactures!	
demand, Indiana.....	9
plant, Portsmouth, Va.....	229
practical work and	
actual problems.....	485
rules.....	490
South Manchuria Railway	
Co.....	484
temperature, affects	
viability of seed.....	489
supply.....	245, 470-471, 473
affected by Manchurian	
events.....	144
by States.....	463-464, 469
changes.....	81
constant, needed for	
crushers.....	496
international.....	476
shortage.....	93
surplus	
control.....	419
handling, cooperative,	
Piatt County, Ill.....	69
outlet	
in industry.....	48
Iowa.....	56
seasonal, should be con-	
trolled by equalization	
fee.....	419
sold to mills.....	187
Sweden.....	973
tariff.....	129
needed.....	406
rates.....	81
suggested.....	407
taste, bitter, removal	
processes.....	1174, 1295
threshing.....	5, 11, 34, 64, 79,
100, 110, 119-120, 128, 197, 199,	
242, 250, 253, 272, 281-282, 284,	
369, 372-373, 387, 847	

<u>Item</u>	
Soybeans - Continued	
threshing - continued	
bar cylinder thresher...	351,
370	
ease.....	796
facilities, not kept	
up with increase	
in acreage, Ohio.....	365
grille construction.....	346
hints.....	365
Illinois.....	84, 86
immediate factors to	
be considered.....	304
injury, effect upon	
longevity and vigor	
of the seed.....	486
Iowa.....	152
Kentucky.....	124
loss, cut with use of	
combine harvester.....	366
methods.....	123, 154, 209,
360, 362, 753, 819	
to prevent deteriora-	
tion and loss.....	382
power required.....	365
slow cylinder speeds	
recommended.....	352
West Virginia.....	37
time required for	
maturing.....	64
trade.....	80, 97, 220, 618
Asia.....	448
Europe.....	448
foreign and inter-	
national.....	42, 130,
248, 300, 418, 452,	
461, 465	
future, estima-	
tion.....	418
restrictions	
affecting.....	418
trends.....	418
Manchuria.....	451
United Kingdom.....	220
various countries.....	97
world.....	457
and soybeans in U.S....	4d



<u>Item</u>	
Soybeans - Continued	
transportation needed.....	179
treatment	
apparatus, patent.....	1437,
1559,1575	
factory for, equipment	
and management.....	499
patent.....	1476,1479,1483,
1494,1497,1592	
process	
improvement, patent...	1420,
1424-1425	
patent.....	1410,1419,
1423,1440,1450,1487,	
1491,1514,1518,1520,	
1559-1560,1605,1608	
with dilute sulphuric	
acid.....	620
See also Soybean products;	
Soybeans, uses, food	
products	
trends.....	81
undesirable, on lands	
subject to blowing or	
erosion.....	749
unimportance as farm crop,	
after 30 years.....	157
urease, influence upon	
urea.....	546
uses.....	1,5,15,25,35-36,
43,52,55,63,75,77-79,85-87,	
89,95-96,99,107,110,112,	
114-115,118-119,121,125,	
128,130,133,138,150,153-	
154,158-160,167,170,172,	
175,182-183,192,194,203,	
205,207,218-219,234,240-	
242,248,251,261,265,270,	
272-273,278,281,283,285,	
288-289,292,297,406,418,	
448,466,491,493,501,504,	
507,509,515-517,521,532,	
540,542,547,551,556,597,	
619,635,753,792-793,812,	
819,836-837,847,887,925,	
943,1174,1218,1255	
agricultural See Soybeans,	
uses, farm	

<u>Item</u>	
Soybeans - Continued	
uses - continued	
ancient.....	4c
as agent for decolorizing	
and clarifying	
tannin and dyestuff	
extracts, patent.....	1454
as aromatic plant.....	518
as buttons.....	551
as cash crop.....	32,61,66,
126,164,192,287,398,	
514,764	
chances of expansion...	92
Corn Belt.....	932
Indiana.....	9
Iowa.....	116
Kansas.....	129,303
Middle West.....	126,419
Southern States.....	214
as decomposition	
products.....	620
as digest medium	
replacement for meat	
infusion in routine	
work.....	593
use in preservation	
of stock cul-	
tures.....	593
as forage crop See Soy-	
beans, uses, farm, as	
forage crop	
as oil plant.....	17
Europe.....	17
Far East.....	17
importance.....	511
as powder, in floor-	
cover composition,	
patent.....	1541
as substitute for meat	
in microbiological	
practice.....	536
by cotton oil mills.....	565
Canada.....	142
China.....	1382
combination of various	
uses.....	514
commercial See Soybeans,	
uses, industrial	

Item

Soybeans - Continued

uses - continued

demonstration, Pennsyl-

vania Railroad.....548

determined by metabolism

experiments on mice....1320

Far East.....211,264

farm.....2,49,131,135,

141,157,198,244,249,269,

282,464,502,528,532,566,

786,812,855,923,1072,

1392

acreage for, increas-

ing.....1406

A. P. Meharry farm,

Champaign, Ill.....237

as aid to corn crop.....802

as feed.....4d,18,29,36,

66,81,87,89,96-97,120,

126,135,146,162,182,

188,203,209,225,258,

272,280,296,306,381,

445,503,511-512,515,

517,527,534,543,549,

553,565,751,763-764,

773,776,783,791,806,

809,817,821,823-824,

833-835,837,842,848,

877-878,886-887,889-

890,893,901,912,921-

923,925,928,931,942,

1009,1092,1162

comparison

with alfalfa.....824

with cottonseed

meal.....991

with other con-

centrates,

Maryland.....828

with other standard

protein feeds,

Tennessee agri-

cultural experi-

ment station..1004

Czechoslovakia.....241

demonstrated,

Tennessee agricul-

tural experi-

ment station..1004

Item

Soybeans - Continued

uses - continued

farm - continued

as feed - continued

Eastern States.....59

effect of cystine

and casein

supplements

on.....1233

experiments with

rats.....927,1115

for cattle....547,823,

834,919,969,

985,1015

Arkansas.....140

beef, effect

upon firmness

of fat....4a,4b,

4c,4e,225,865,

867,904,917,

991,1023-1024

calves.....886

equal to lin-

seed oil-

meal.....981

dairy.....187,796,

822,828,833,886,

889,893,904,917,

958,961-962,966,

969,977,985,998,

1002,1009-1010,

1025,1030-1031

compared with

cottonseed

meal and

soybean oil

meal.....1000

compared with

linseed

oilmeal...966,

977,1009

compared with

oilmeal...993

decrease cost

of milk

produc-

tion.....1002

effect upon

butter....962,

1002,1027-

1028



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
uses - continued	uses - continued
farm - continued	farm - continued
as feed - continued	as feed - continued
for cattle - continued	for hogs.....4,4a,4b,
dairy - continued	4c,4e,95,155,166,
effect upon	806,822,828,865-
flavor and	867,886,904,917,
composition	919,1035-1036,
of milk,	1039,1043,1045,
cream, and	1048,1051,1060,
butter.....1001	1067-1068,1070-
gave six percent	1071,1074,1076-
less milk	1078,1082,1085,
and eight	1089,1091-1092,
percent more	1094,1098-1099,
fat than	1100-1101,1111,
oilmeal.....993	1115,1118
promises to be-	compared with
come leading	cowpeas, Cedara,
feed, Tennes-	Union of South
see.....1004	Africa.....1112
relative ad-	compared with
vantages and	soybean oil-
disadvant-	meal.....1087
ages.....1003	compared with
substitute for	tankage.....1118
linseed and	cooked and
cottonseed	roasted, nutri-
meal.....958	tive value
trials.....284	superior to
with alfalfa	raw soybeans
hay, equal to	combined with
linseed oilmeal	yellow corn
in grain	and miner-
rations.....979	als.....1115
with corn silage,	effect
alfalfa hay,	on dressing
cracked corn	percent-
and ground	ages.....1039
oats, worth	on quality of
one-third	pork....1039,
more than	1066,
oilmeal.....998	1080,
vs. linseed meal..995	1113-
	1114

Item

Soybeans - Continued  
 uses - continued  
   farm - continued  
     as feed - continued  
       for hogs - continued  
         effect - continued  
           on quality of  
             pork - continued  
               cause of soft  
                 pork, 1024,  
                 1040, 1047,  
                 1062, 1094,  
                 1097, 1102,  
                 1109, 1115  
       Corn  
         Belt. 1116  
       on shrinkage of  
         carcasses in  
         cooler.....1039  
       on value of  
         carcasses..1039  
       good though expen-  
         sive.....893  
       Indiana agricultural  
         experiment  
         station...878, 1080  
       methods....1083, 1091-  
                 1092, 1098  
       without deleterious  
         results  
         sought.....1039  
       Mississippi.....1036  
       need for definite  
         restrictions..1113  
       objections do not  
         apply to soybean  
         oilmeal.....904  
       Ohio agricultural  
         experiment  
         station..1085, 1093  
       rate and economy of  
         gains...1039, 1098,  
                 1107  
       should be more ex-  
         tensive, Corn  
         Belt.....1118  
       southern Minne-  
         sota.....781

Item

Soybeans - Continued  
 uses - continued  
   farm - continued  
     as feed - continued  
       for hogs - continued  
         substitute for  
           tankage....1058,  
                         1074  
         should not be  
           relied  
           upon..1090  
       supply, small, can  
         account for  
         only small amount  
         of soft  
         pork.....1040  
       with corn.....1058,  
         1079, 1082, 1087,  
         1090, 1096, 1103,  
         1117, 1121  
       compared with  
         corn alone,  
         Missouri..770  
       compared with  
         middlings and  
         tankage and  
         corn.....1103  
       compared with  
         other high-  
         protein feeds  
         and corn 1092  
       compared with  
         soybean oil-  
         meal and  
         corn.....1084  
       compared with  
         tankage and  
         soybean  
         oilmeal..1087  
       Corn Belt..1105  
       Fayette County,  
         Ind.....1081  
       Georgia.....1052  
       not adequ-  
         ate.....1090  
       proportions  
         possible with-  
         out affecting  
         quality of  
         pork.....1066



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
uses - continued	uses - continued
farm - continued	farm - continued
as feed - continued	as feed - continued
for hogs - continued	for poultry....4a,155,
with corn - cont'd	561,823,865,904,
supplemented	919,1127,1132,
with mineral	1136,1146-1148
mixture....1119	compared with
with corn and	meat scraps 1139
clover.....1098	compared with to-
with corn and	mato seed and
tankage.....1061	peanut pro-
with corn meal,	teins.....1272
inferior to	Delaware agri-
wheat middlings	cultural experi-
and corn for	ment sta-
quality of meat	tion.....1146
production....1070	Illini bean....1127
with grain,	supplemented
Delaware.....1064	with miner-
for horses.....889,904,	als.....1140
919,1122	for rabbits.....1246-
Arkansas.....140	1247,1257,1384
for lambs.....4a,865,	for sheep...4e,166,561,
1154-1155	822,867,904,917,
compared with	1152
oats.....1160	with corn.....1154
hullings, with	<u>See also</u> Soybeans,
shelled corn,	uses, farm, as
supplemented	feed, for lambs
with soybean	ground, substitute
products or	for linseed
linseed oil-	oilmeal.....1009
meal.....1156	high quality.....848
with shelled	Iberia livestock
corn.....1155	experiment farm,
with shelled corn	Jeanerette, La..879
and soybean	Illinois.....44
straw or	Iowa.....151
hullings.....1156	Kansas.....38
<u>See also</u> Soybeans,	methods.....762
uses, farm, as	New York.....810
feed, for sheep	Pennsylvania.....53
for mules.....904,1122	poisoning, re-
	search.....926

Item

Soybeans - Continued

uses - continued

farm - continued

as feed - continued

possible, substi-

tute for expen-

sive protein con-

centrates,

Kansas.....303

solve farmers'

problem.....799

Southern States....4,214

substitute for high-

priced concen-

trates.....848,894

substitute for oil-

meal.....796

Cerro Gordo

County, Ia..950

supplement to carbo-

hydrate-rich

feed,livestock

feeding.....930

supplement to standard

grain crops,

Corn Belt.....923

Texas.....46

trials.....5,902

value as high as

alfalfa.....783

with corn.....872,930

cystine defi-

ciency.....930

with mineral mixture 126

as fodder See Soybean

fodder

as forage See Soybean

forage

as grain.....171,520,822,

842,848-849,854

Mississippi.....741

mixed with corn.....520

New Jersey.....40

as green manure.....21,97,

240,257,528,547,549,

551,739,815,841,856

advisability.....147

compared with

cowpeas.....832

Item

Soybeans - Continued

uses - continued

farm - continued

as green manure - cont'd

Connecticut.....22

handling, under

conditions

typical of

Louisiana sugar-

cane planta-

tions.....740

related to composi-

tion changes

toward maturity 739

substitute for

expensive

manure.....757

varieties best for,

New York.....285

See also Soybeans,

effect on soil

as nitrogenous seed

and hay-producing

plant, best

annual.....894

as preparatory crop

for tobacco,

experiments.....775

as replacement crop

for alfalfa or

clover.....913

for clover....187,550,

793,798,803,880

for clover or other

crops.....171

for corn.....66,143

middle West.....834

for cotton.....102

for cowpeas,

south Louisiana 314

for lima beans.....190

for oats.....290

result of contract

guaranteeing

definite price

per acre.....400

Wapello Co.,

Iowa.....291



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
uses - continued	uses - continued
farm - continued	farm - continued
as replacement crop - cont'd	in crop rotation - cont'd
for oats and corn,	grown with corn - cont'd
Piatt County,	Corn Belt.....289
Illinois.....14	costs.....1072
for surplus crops,	labor and
as corn, wheat	power.....320
and oats.....276	effect on corn 1086
as soil-builder <u>See</u>	yields.....819
Soybeans, effect on	Champaign,
soil	Ill.....83
catch crop.....764,941	effect upon dry
compared with uses of	matter percentage
cowpeas.....68,79,156-	of the two
157,166,256,392,755-	crops.....947
756,832,844,937	fertility
compared with uses of	value.....744
oats .....455	good only in
Cotton Belt.....197	theory.....765
emergency crop,	increase pork
Iowa.....151	production
for late planting....70,755	per acre.....742
for silage <u>See</u> Soybean	injury to corn..806
silage	Iowa.....783
general purpose farms,	Kansas.....303
Illinois.....72	Knox County,
in crop rotation.....4a,29,	Mo.....1043-1044
79,85,100,120,125,166,	lessened losses
282,296,764,776,808-809,	through chinch
815,835,847	bugs, Macoupin
compared with	County, Ill..759
cowpeas.....792	Missouri.....770
compared with oats	no injury to
rotation.....455	corn.....771
Corn Belt.....83,199,	or sunflowers...939
283,816,850	production,
Europe.....125	Louisiana....320
grown with corn..68,145,	profitable..746,772
235,253,745,777,	three rates of
796,831,852,931,943	planting.....744
advantages....765,785	value.....823
and sunflowers,	determina-
for fodder,	tion.....744
yield per acre 910	for grain...744-
as cattle filler	745
after silo-	for silage..744-
filling time...746	745

<u>Item</u>	
Soybeans - Continued	
uses - continued	
farm - continued	
in crop rotation - cont'd	
grown with corn - cont'd	
Wildwood farms,	
Richmond, Va...	782
yield	
average ex-	
pected.....	253
Fort Collins,	
Colo.....	204
increased per	
acre.....	742
Wooster, Ohio..	253
<u>See also</u> Soybeans,	
uses, farm	
grown with corn, sudan	
grass and	
cowpeas.....	887
grown with oats.....	455
Pennsylvania.....	183
<u>See also</u> Soybeans,	
uses, farm	
grown with other	
crops.....	100,174,
257,293,447,475,	
777,822,870,920	
advantages.....	122
New Jersey.....	40
West Virginia...	37
grown with sudan	
grass.....	866
following corn,	
Iowa Agricul-	
tural Experi-	
ment sta-	
tion.....	851
<u>See also</u> Soybeans,	
uses, farm	
Ianoka Farm, Iowa....	804
Illinois.....	825
in rotation with rye,	
New Jersey Agricul-	
tural experiment	
station.....	317
Indiana.....	63
Missouri.....	122
Ohio.....	321

<u>Item</u>	
Soybeans - Continued	
uses - continued	
farm - continued	
in crop rotation - cont'd	
Oklahoma.....	161
Pennsylvania.....	183
Piedmont and	
mountain sections	
of North	
Carolina.....	299
problems of work-	
ing in.....	915
reduce costs of	
production.....	4
substitute for	
clover...66,235,848	
substitute for	
oats.....	767
West Virginia.....	57
with corn.....	830
with corn, wheat and	
clover	
Champaign county,	
Ill.....	836
Indiana.....	63
value.....	64
with maize and	
teff.....	843
with rice,	
Louisiana.....	758,
794-795	
with winter bar-	
ley.....	840
in diversified farming,	
Cotton Belt.....	761
in insect control.....	4b
in land reclamation,	
Yazoo-Mississippi	
Delta.....	799
in manufacture of	
aqueous emulsions	
containing	
lecithin, patent..	1429
in manufacture of beer	
and spirits,	
patent.....	1446
in paint and varnish	
industries.....	551,
584,588,624,714	
<u>See also</u> Soybean oil,	
uses, in paint and	
varnish industries	



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
uses - continued	uses - continued
farm - continued	food - continued
in production of	498,502-506,508,511-512,
semiplastic material,	519,522,524,526,528-530,
patent.....1462	532-535,543,546-547,549,
in production of stable	553,555,557-558,560-561,
water-containing	565-566,602,823,887-888,
emulsions, patent...1467	917,952,1101,1168,1173,
in production of	1178,1185-1186,1205,
thickening materials	1208,1211,1216,1219,
for use in printing,	1231,1254,1256,1258,
improvements,	1262,1275,1280,1283,
patents.....1430	1290-1291,1306,1309,
in protein decomposition	1319,1323,1328,1331-
products, patent....1580	1332,1338,1340,1352-
in sizing preparation,	1353,1361,1366,1370,
patent.....1435	1391,1398,1405-1406
in synthetic fiber..603,631	analysis.....502
in the arts.....126	and Chinese gypsum
increase.....330	in frozen con-
Indiana.....189,848	fection, patent...1602
Missouri.....154	Arkansas.....140
New Jersey.....40	as coffee substitute
Pennsylvania.....455	Czechoslovakia.....241
profitable.....762	patent.....1443
readjustment of crop	as meat substi-
acreage.....754	tute....1185,1303,1376
supplement for alfalfa	patent.....1441
shortage, Kansas.....303	as substitute for
supplement to clover....951	nearly every ordinary
supplement to corn,	dish on average
Corn Belt.....143	menu.....1204
supplement to milk	assimilation.....1303
check, Vermont.....644	biological value.....58
to control chinch bugs..826	bone building
varied, makes them	potency.....1194
adaptable to any	compared with
farming or cropping	cow's
system in South	milk.....1194
Carolina.....514	bread-leavening com-
Vermont.....644	position, patent..1438
food...4,4d,16,18,29,41,54,58,	cause of production
60-61,68,77,80,88-89,93,97,	increase.....492
117,119,126,130,134-135,141,	cheap and nourish-
152,163,166,175,192,198,200,	ing.....1393
202,207-209,212,215,220,228,	chemical analysis....1398
244,257,268,271,273,277,296-	China.....1167
297,301,430,445,491,493,496,	worth adoption in
	United States..1167

Item

Soybeans - Continued

uses - continued

food - continued

    compared with lima  
        beans.....190

    compared with other food  
        products.....1353

    compared with other  
        legumes.....1241

    component of balanced  
        diet.....1325

    condiments and sauces  
        from, patent.....1586

    cooking

        directions.....1356

        qualities.....1199

See also Soybeans, uses,  
            food, recipes

    demand, constant.....19

    digestibility.....297, 455,  
        887, 1053, 1152, 1183,  
        1241, 1303

    dried, vitamins B<sub>1</sub> and B<sub>2</sub>  
        content, compared with  
        cow's milk powder  
        (Klim).....1402

    dumplings, preparation 1407

    East Indies.....61

    exclusive diet,

        deficient in vitamins  
        A and D and mineral  
        salts.....1300

    experiments with

        rats.....927, 1101,  
            1205, 1234, 1300, 1326-  
            1328

    extent to which meet  
        requirement of grow-  
        ing child.....1387

    Far East.....144

    for diabetics....1177, 1222,  
        1230, 1296-1297, 1340,  
        1354, 1375, 1549

        patent.....1501

    for infants.....1238, 1292,  
        1315, 1342, 1347, 1351,  
        1354, 1356, 1362-1363,  
        1369, 1386-1389, 1401

    with condensed  
        milk.....1355

Item

Soybeans - Continued

uses - continued

food - continued

    French army.....1175

    fuel value, compared  
        with other legumes  
        used as human  
        food.....1183

    green vegetable...4c, 1190

    if supplied in  
        appetizing way....1216

    in baking.....1173, 1397

    in cases of inflamma-  
        tion of the kidneys,  
        recommended .....1230

    in confectionery....1298,  
                                1357

    in malted food,  
        patent.....1607

    in manufacture of  
        synthetic nuts,  
        patent.....1583

    in special diets.....1309

    in synthetic nut  
        production,  
        patent.....1583

    in treatment of purulent  
        urinary infections,  
        eczema.....1177

    in treatment of pyuria  
        in infants.....1308

    introduction into diet  
        of white race....1208

    Italy.....58, 1202, 1260

    limited

        compared with  
            Orient.....1232

        due to competition  
            of navy bean...1232

    literature summar-  
        ized.....1322

    metabolism experiments  
        with bread made from  
        mixture of soybean  
        flour and rye-wheat  
        flour.....1320

    new source of national  
        food supply.....536

    nutritive value,  
        improved by  
        heating.....493



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Soybeans - Continued
uses - continued	uses - continued
food - continued	food - continued
"Okara", antirachitic	prospects.....505,1218
properties.....1261	protein supplement
organic nutrients,	rather than fatten-
compared with other	ing foods.....922
legumes.....1183	recipes.....80,119,192,
pellagra-preventive,	512,1186,1309,1325,
trials.....1228	1348,1356,1391-1392
pie.....1298	recommended.....1230
popularity, reasons....1283	roasting with sugar,
possibility.....526,1406	simplified
products.....60,135,188,	method.....1298
202,207,210,221,495,	salts content compared
506,531,537,1183,1200,	with other foods..1353
1208,1222,1232,1256,	soup.....551
1353,1360	canned, used in
cheap.....1204	French army....1175
chemical composition 297	soybean-wheat bread,
digestive utiliza-	experiments with
tion.....58	rats.....1268
Far East.....17	substitute for other
firms handling or	materials furnish-
manufacturing....1396	ing protein and
France.....1175	fat.....1393
Japanese investiga-	suggested as American
tions.....1329	article of diet.....28
liquid, process,	Texas.....46
patent.....1509,1538	treatment
patent.....1407,1414,	methods.....1262,1288,
1426,1431,1433,1479,	1306,1325
1481,1489,1498,1509,	patent.....1453
1511,1516,1521-1522,	used like navy
1536,1560,1593	beans.....1394
preparation...1262,1304,	value increased by
1318,1340,1394	harvesters.....381
Eastern coun-	varieties acceptable
tries.....1223	to American
patent.....1591	palate.....1406
specific dynamic	various countries....115
action.....1383	West Virginia.....57
<u>See also</u> Soybean	whipped protein, as
products; names of	substitute for egg
products and Soybean	white.....1313
cheese, Soybean	for Oriental beans in
milk; etc.	U. S.....188

<u>Item</u>	
Soybeans - Continued	
uses - continued	
France, urged.....	555
in artificial leather.....	551
in artificial petroleum....	523
in artificial wool.....	507
in automobile industry....	544,
	603, 623, 625
Ford plant.....	134, 210, 574,
	578-579, 594-595, 623
importance to farming	
industry.....	48
processes used.....	623
resin products.....	583
synthetic fiber,	
for upholstery.....	603
in chemical trade.....	537
Indiana.....	10
industrial.....	4a, 18, 25, 49-51,
	54, 58, 74, 80, 92, 98, 117, 134-
	135, 172, 186, 210, 220, 228,
	244, 268-269, 280, 282, 415,
	495, 498, 502, 505-506, 508,
	511, 519, 526, 530, 532-533,
	536, 543, 546, 552-553, 557-
	558, 560, 566, 575, 581, 591,
	596, 602, 605, 612, 617, 627,
	1214
cause of production	
increase.....	492, 1406
development.....	7, 569, 638
47 companies.....	42
may be created by	
soybean expansion.....	92
new.....	544
non-competitive with	
existing domestic	
products.....	92
numerous.....	528
of primary importance...	144
projects, U. S. Regional	
soybean industrial	
products labora-	
tory.....	600
prospects.....	164, 276,
	492, 505, 526
central States.....	164
Cuba.....	597

<u>Item</u>	
Soybeans - Continued	
uses - continued	
industrial - continued	
usually displace some	
other product.....	495
varieties for.....	626
intelligent, promotion	
campaign, Philippine	
Islands.....	1201
lines of study needing	
investigation listed..	506
Louisiana state peniten-	
tiary, Baton Rouge,	
La.....	617
Massachusetts.....	112
medicinal.....	58, 135, 518, 558
in treatment of kidney	
inflammation.....	1230
See also under Soybeans,	
uses, food	
Minnesota.....	781
modern.....	4c
more numerous than any	
other legume, Iowa...	783-
	784
more than any other	
agricultural	
product.....	549
most profitable.....	913
Nebraska.....	120
Netherlands-Indies.....	115
new.....	414, 495
opportunities for,	
wider.....	287
without displacing	
crops.....	568
North Carolina.....	292, 295
numerous and varied.....	874
of non-fatty portion....	501
principal.....	552
recommended, Wisconsin...	159
research.....	25, 544, 619
See also Soybeans,	
research	
silk from.....	615
South Dakota.....	65
special.....	545
West Virginia.....	57



<u>Item</u>	
Soybeans - Continued	
uses - continued	
technical.....	558
therapeutic <u>See</u> Soybeans,	
uses, medicinal	
universal, more than	
other legume crops	
grown in South	
Carolina.....	514
utilization of waste	
liquors, patent.....	1544
various countries.....	115,
555,883,887	
West Virginia.....	37
western world.....	211
wide variety.....	563
value.....	462,465,475
by States.....	475
market.....	78
per unit.....	284
various countries.....	138
varieties.....	5,35,68,112,114,
119,121,159,172,174,193,	
234,253,297,473,806-807,	
809,822	
adaptation	
adapted to various	
uses.....	37,261,
296,801,867	
Illinois.....	84
Indiana.....	282
Jackson County,	
Iowa.....	845
need for.....	116
Ohio.....	820
South Dakota.....	110
and development, major	
part of investiga-	
tion to date.....	602
Arkansas.....	24
Georgia.....	252
Hawaii.....	206
increase in knowledge	
of.....	175
Indiana.....	10
<u>See also</u> Soybeans,	
adaptability	
analysis.....	194,198,1256
Arkansas.....	24

<u>Item</u>	
Soybeans - Continued	
varieties - continued	
best for good produc-	
tion.....	756
best seed-yielding.....	133
best suited to	
various growing	
conditions.....	688
Biloxi.....	1054,1299
Canada.....	55
characteristics.....	112,121
in relation to compo-	
sition.....	443
chief producing states...	112
choice of.....	825
classification.....	112
Eastern States.....	59
edible.....	4e
experiments.....	172,285
Illinois.....	26,86
New Hampshire Agricul-	
tural experiment	
station.....	198
New York.....	285
value.....	172
for commercial production,	
recommended.....	199
for grain.....	34
New York.....	285
Illinois.....	86
Iowa.....	151
Japanese, composition...	1256
Kentucky.....	124
Laredo.....	1036
Massachusetts.....	1
Minnesota.....	781
Mississippi.....	71
Missouri.....	64
Montana.....	196
new.....	173
northern Idaho.....	96
number introduced into	
U. S.....	173
Pennsylvania.....	182-183
Piedmont and mountain	
regions of North	
Carolina.....	299
recommended for different	
areas.....	174

<u>Item</u>	
Soybeans - Continued	
varieties - continued	
South Dakota.....	65
studies.....	4e
various countries.....	112
West Virginia.....	57
Wisconsin.....	158,160
<u>See also</u> names of individual	
varieties under heading	
<u>Soybeans</u> , as Cayuga, etc.	
Vermont.....	520
vs. cowpeas.....	565
vs. oats.....	182
vs. peanuts.....	565
viability	
affected by moisture content	
and temperature in	
storage.....	489
affected by oil content....	489
Virginia.....	271,392
vitamin content..	207,527,783,1183
can serve as sole source	
of vitamins for growing	
rats.....	1263
good source of vitamins	
A, B, and G, and poor	
source of vitamin C....	1310
Leipzig, Germany.....	442
richer than corn.....	916
vitamin A	
content.....	1242,1290
suppressing factor.....	974
vitamin G, stable under	
pressure cooking.....	1299
weighing rules, Kansas.....	404
West Virginia.....	955
will revolutionize industrial	
America in ten years.....	210
will revolutionize nutrition	1254
Wisconsin.....	747
wonder crop.....	1078
worth growing, Wisconsin.....	158
yield per acre.....	5,16,35-36,
38,79,81,87,89,100,105,131,	
146,182,199,203,211,254,257,	
280,285,296-297,301,315,455,	
461-462,464,474,543,760,805,	
821,887,943	
Arkansas.....	24

<u>Item</u>	
Soybeans - Continued	
yield per acre - continued	
basis of value of	
seed and hay.....	173
better than yield of	
oats, Wapello County,	
Iowa.....	291
by States.....	5,81,240,
462-464,472	
other than Nebraska....	120
Champaign, Ill.....	83
chief producing	
countries.....	452
compared with other	
grains.....	58,119
corn and cowpeas....	34
cowpeas and field	
beans.....	784
Nebraska Agricultural	
experiment	
station.....	120
conditions influencing...809	
considered in determining	
best varieties for	
New York.....	285
cotton section.....	197
effect of different	
practices in growing	
and harvesting on,	
Illinois.....	323
expected.....	176,239,
817,833,953	
Pennsylvania.....	53
Fort Collins, Colo.....	204
good.....	288
Hawaii.....	206
in protein, greater than	
other legumes.....	923
increased	
by acreage inspection	177
by liming.....	798
through improvement in	
cultural methods,	
Iowa.....	152
Iowa.....	152
Madison, Wis.....	159
Massachusetts.....	112
Nebraska.....	120,247
New Hampshire.....	198



<u>Item</u>	<u>Item</u>
Soybeans - Continued	Sprung, Hertha: Edelsoja.....1178b
yield per acre - continued	Squirrel, W. J.: Soybeans in
New Jersey Agricultural	Ontario. With J.
experiment station.....317	Laughland.....242
not profitable year after	Ssadikow, W. S.: Verfahren
year, Texas.....102	zur herstellung von
not sufficient to be good	sojabohnennmilch. With M. A.
feed crop, Winnebago	Franzusowa and E. G.
County, Ill.....937	Chaletzkaya.....1373
of dry matter.....301	Stafford, E. N.: Twenty years
off-season.....19	with soybeans. Conclusions
Ohio State university.....253	derived from experience on
Pennsylvania.....183,815	Meharry Farms. With C. L.
sections ravaged by	Meharry, W. E. Riegel,
drouth and chinch bugs..108	L. J. Withrow, and J. M.
South Dakota.....65	Crumbaker.....4a
various countries..103,211,454	Staley, A. E.....717
various stages of	Staley, A. E., manufacturing
maturity.....347,390	company, Decatur, Ill.....510,
Missouri.....380	1374,1427,1476
West Virginia.....57	part played in develop-
Wooster, Ohio.....253	ing soybean in-
See also Grains; Legumes;	dustury.....717
Oil seeds; Seeds	plant established for
Soyland.....4a,816	soybean oil ex-
Soyolk See Soybean flour (Soyolk)	traction.....716
Spence, H. L.: Soybean produc-	system of manufacturing
tion in Idaho. With H. W.	oilmeal.....163
Hulbert.....96	Staley, A. R.: Soy sauce goes
Spencer Kellogg & sons, Chicago	American.....1374
soybean elevator.....487	Standard brands incorporated.
Spencer Kellogg & son, Des	Treating seeds, beans and
Moines, Iowa.....480	the like (patent).....1590
fire in oil mill.....483	Standard soybean mills,
Spillman, W. J.: Successful	Centerville, Iowa.....683
hog and seed-corn farm.....1107	Stark, R. W.: Environmental
Spirk, Ludvik: Soybean as a	factors affecting the pro-
raw material in chemical	tein and the oil content of
industry.....241	soybeans and the iodine
Spoerri, N. T.: Extraction	number of soybean oil.....443
methods.....493	Steece, H. M.: Soybean projects
Sprague, H. B.: Soybeans for	of the state agricultural
grain.....834-835	experiment stations, 1937...243
Sprays, dormant, mixed with	Steele.....668
soybean oilmeal as an	Steele, L. L.: New hexabromide
emulsifier effect additional	test for linseed oil.
saving of 10% on tank-mixed	With F. M. Washburn.....664
emulsions.....657	

<u>Item</u>	<u>Item</u>
Steen, Herman	Stitt, R. E. - Continued
Many products made from	Soybeans for Massachusetts.
soybeans.....552	With A. B. Beaumont.....863
Taking out the gamble.....417	Stockholm, K. Lantbruks-
Steenbock, H.....952	Akademien, Sojanjöl och
Effect of cystine and casein	sojakakor.....896
supplements upon the nutri-	Stockman, Ralph: Soya meal
tive value of the protein	as a cattle food.....1020
of raw and heated soybeans.	Stockman, Sir Stewart.....989
With J. W. Hayward and G.	Cases of poisoning in
Bohstedt.....1233	cattle by feeding on
Effect of heat as used in the	meal from soya bean after
extraction of soy bean oil	extraction of oil.....1021
upon the nutritive value of	Stokes, I. E.: Studies of soy-
the protein of soy bean	beans and other green manure
oil meal. With J. W.	crops for sugarcane
Hayward and G.	plantations. With George
Bohstedt.....1234	Arceneaux and Nelson
Stehlé, H.: Le soja.....244	McKaig, Jr.....740
Stephenson, R. E.....823	Stolk, C. C. C. Van: Treatment
Stevens, A. H.: Improvements in	of soya beans (patent).....1592
or relating to processes of	Stone, W. M.
preparing soya beans for	Soybean and its uses .....837
consumption, and the products	Soybeans and corn.....838
resulting therefrom (patent) 1591	Storozhuk, M. K.: Technologie
Stewart, C. L.	der herstellung und
Le commerce international	methoden der desodorierung
des fèves de soya et de	der sojanilch. With V. D.
leurs sous-produits.	Bogatskii and V. A.
With O. L. Whalin.....418	Murontsev.....1182
Supply and marketing of	Strayer, Bert.....23
soybeans and soybean	Street, J. P.....36
products. With W. L.	Carbohydrates and the
Burlison, L. J. Norton	enzymes of the soy
and O. L. Whalin.....245	bean...With E. M.
Stewart, J. R.: Soya bean and	Bailey.....1375
Manchuria.....246	Tests of soy beans, 1915.
Stewart, P. H.: Soybeans in	With E. H. Jenkins
Nebraska. With D. L.	and C. D. Hubbell.....36
Gross.....247	Tests of soy beans in 1916.
Stewart, Robert: Soy beans in	With E. H. Jenkins
the corn belt.....836	and C. D. Hubbell.....525
Stietz, Erich: Die soja in der	Strickler, P. B.: Uses of
weltwirtschaft.....248	soybeans in feeding.....553
Stitt, R. E.	Striganova, A. R.: Influence
I. Factors in soybean produc-	of soybeans on the gastric
tion; II. Variety recommenda-	secretion.....1376
tions and characteristics.	Strohal, Dragutin: Soy bean
With R. L. Lovvorn and	food (patent).....1593
P. H. Kine.....801	Stryker, Ohio.....106



<u>Item</u>	<u>Item</u>
Stuart, H. C.: Soy bean food preparation for feeding in- fants with milk idiosyncrasy. With L. W. Hill.....1238	Suzuki, Kozo - Continued Nutritive value of soy-bean cakes. With Ataru Yazaki:.....1377
Sturtevant, Austin marketing of soybeans.....223 Soy bean - agriculture's "extra dividend".....249	Soya bean cake as protein supplement of poultry feed. With Tadashi Hatano.....1145
Sudan grass carbohydrate content.....954 grown with soybeans.....866,887 and cowpeas for silage, compared with each crop used alone.....954 followed by corn, Iowa Agricultural experi- ment station.....851 for hay.....253,871 protein content.....954 shipments.....473	Soy-bean cake for the fattening of swine.....1108
Sufu <u>See</u> Soybean cheese	Suzuki, Tozaburo Apparatus for brewing soy. (patent).....1594 Apparatus for making soy extracts (patent).....1595 Process of brewing soy (patent).....1596 Process of making foods (patent).....1597
Sumner, H. R.: Growing soybeans in eastern Kansas.....250	Suzuki, U.: Ueber die chemische zusammensetzung der japanischen soja-sauce oder "schōyu". With K. Aso and H. Mitarai.....1378
Sun, Wei: Preparation of emulsion paints from soy- bean casein. With Tze- Hui Shen.....614	Suzuki, Umetaro Further evidence for the occurrence of vitamin E in soy bean oil. With Waro Nakahara and Yoshikazu Sahashi.....1379
Sunflower cake, use in feeding dairy cattle, Sweden.....973	Occurrence of vitamin E in soy bean oil. With Waro Nakahara and Yoshikazu Sahashi.....1380
Sunflowers grown with corn and soybeans for fodder and silage.....910 grown with soybeans.....939	Sweden.....896,973 Sweeney, O. R. (quoted).....56 Processing the soybean. With L. K. Arnold.....251
Surls, M. F.: Use of soy bean oil as a core binder. With F. G. Sefing.....709	Sweet potatoes, Louisiana.....314
Suzuki, Kozo [Nutritive value of soya-bean cakes.] With A. Yazaki.....722	Swift, R. W.....967 Swift and co.....1102 soybean plant at Champaign, Ill.....723
Digestion experiment of soy bean cake and kaoliang with poultry.....1143	Swine <u>See</u> Hogs
Nutritive value of soy-bean cake for hens. With Tadashi Hatano.....1144	Swingle, F. B.: Machines in- crease soy bean profits.....379

<u>Item</u>	
Switzerland.....	1453,1518,1542,1609
Sylvanus, E. B.: Soy-bean paste as an emulsifying agent. With A. M. Field and B. H. Alexander.....	1320
Symski, A. M.: Claytonisation of soybean seeds. With M. S. Dunin and F. M. Shemiakin.....	435
Szanto, Josef: Das sojanehl in der diät der zucker- kranken.....	1178
Tabor, Paul: Soy beans for Georgia.....	252
Tag-Heppenstall moisture meter, installation and operation....	423
Taggart, M. F. Mixing soy bean oil and tung oil.....	49
Ungelled drying oil product suitable for varnishes, etc. With F. M. Reece (patent).....	1558
Use of soybean oil in paint.....	4d
Takahashi, Eiji: Influence of soy bean cake upon milk pro- duction and the quality of butter. With Kenzo Iguchi, Kentaro Mitamura, and Kiyoshi Shirahama.....	1022
Takanori, Yoshi, tr.: Present situation of the soybean in the United States.....	165
Takata, Richei: Nutritional studies of the "Miso" preparation.....	1381
Takayama, Yoshitaro: Utilization of the soybean.....	620
Tanaka, Soichiro: On the manu- facture of potash-lye from vegetable ashes and its application for the straw boiling process in the paper-making industry.....	621

	<u>Item</u>
Tankage as feed for hogs effect on quality of pork.....	1113
replaced by soy- beans.....	1058,1090
with corn.....	1055-1056, 1061,1084,1087, 1095,1103
for pullets.....	1140
prices.....	1058
replaceable by soybeans.....	848
Tanner, W. F.: Study of the pellagra-preventive action of dried beans, casein, dried milk, and brewers' yeast. With Joseph Goldberger.....	1228
Tarle, M.: Soya bean and casein.....	622
Taylor, D. D.: Possibility in soy bean production for oil markets from the manufacturer's viewpoint....	287
Taylor, R. L.: How soybeans help build Fords.....	623
Taylor, W. C.: Soybean hay as a supplement to white corn and tankage for growing and fattening hogs. With J. C. Grimes and W. E. Sewell.....	1061
Teff, in rotation, with soy- beans or cowpeas and maize.....	843
Templeton, G. S.: Soybeans for Southern livestock.....	4
Ten Eyck, A. M.: Cowpeas vs. soy beans.....	937
Tennessee...156,933,1004,1208,1324	
Tennessee. Agricultural experi- ment station Crops for the silo.....	933
Home-grown rations in economical production of milk and butter...	1004



<u>Item</u>	<u>Item</u>
Tennessee. Agricultural experiment station - Continued	Thomas, formula modification used.....984
Soy bean. A comparison with the cowpea.....156	Thomas, B. H.....1083
Tennessee academy of science	Effect of ingesting soybeans and oils differing widely in their iodine numbers upon the firmness of beef fat. With C. C. Culbertson and Fred Beard.....1023
Nutritive protein of some newly developed soy beans.....1324	Effect of soybeans upon the firmness of beef fat. With C. C. Culbertson.....1024
Soy bean as human food.....1208	Influence of soybeans upon the gains, feed requirements, and character of the fat produced when fed to growing and fattening spring pigs on rape pasture. With C. C. Culbertson, F. J. Beard, and W. E. Hammond.....1045
Terroine, E.: Laites artificiels pour l'élevage du bétail.....938	Thomasson, R. R.: Soybeans to the rescue.....839
Terroine, E. F.....502	Thompson, A. T.: Why soybeans make flabby bacon.....1109
Testoni, Giuseppe: La soia nell'alimentazione italiana. With Guido Ruata.....1353	Thompson, Firman: Soy bean oil. With H. H. Morgan.....724
Texas.....46-47,102,162,236,533	Thompson, John: Growing soybeans for hay.....941
Thatcher, L. E.	Thone, Frank: Tung trees in America.....725
Corn and soybeans for silage.....939	Thormann, N. S.: Results of practical work and actual problems of drying and storing soybean-seeds. With M. S. Dunin.....485
Harvesting soybeans for hay. With C. J. Willard and J. B. Park.....389	Thornett & Fehr. Review of the oil and fat markets.....450
Life history and composition of the soybean plant. With H. L. Borst.....347	Thuey, L. L.: Frozen confection and process of making same (patent).....1602
Protein content of soybean hay. With J. B. Park.....940	Thurston, Azor: Soybean oil....726
Soybean in Ohio.....253	Tientsin chemical works association, Tientsin, China, experimental work on soybean oil in soap making.....681
Status of the soybean crop in Ohio.....254	
Yield and composition of soybeans at various stages of maturity.....347	
Thévenot, G. D.	
Method for the preparation of a vegetable milk (patent).....1598	
Process of making vegetable milk [from soy beans]. (patent).....1599	
Process of manufacturing milk and cream substitutes (patent).....1600	
Thiele, F. W.: Use of vegetable lecithin (such as that from soy beans) with cereal flour for bread, etc. (patent).....1601	

<u>Item</u>	<u>Item</u>
Timberlake, E. M.: Experience with soy beans.....255	Tokua <u>See</u> Soybean curd
Timothy hay	Tokyo Imperial university, College of agriculture
and corn, supplemented by soybean oilmeal, linseed oilmeal or corn gluten meal in rations for growing lambs.....1159	Condensed vegetable milk.....1277-1278
compared with soybean hay.....198	Ueber die chemische zusammensetzung der japanischen soja- sauce oder "schōyu".....1378
compared with soybean and sudan grass hay.....871	Tokyo Industrial research institute.....437
in dairy ration.....1009	Tokyo Institute of physical and chemical research
Tintometer, Greiner-Wesson- Peep type, determines color of soybean oil.....660	Further evidence for the occurrence of vitamin E in soy bean oil.....1379
Titus, H. W.	Occurrence of vitamin E in soy bean oil....1380
Effects of light, soybean and other diet supplements on seasonal hatchability and egg production: With T. C. Byerly, N. R. Ellis, and R. B. Nestler.....1127	Tokyo Takushōku Kabushiki Kaisha. Imitation powdered milk. With Yoshitaro Yamamoto and Isome Mizusawa (patent)....1610
Soybeans and soybean (oil cake) meal.....942	Tolskaya, E. A.: Heat and moisture régime for the storage of soybean seeds. With M. S. Dunin.....485
Tobacco, planted after soybeans and cotton, experiments.....775	Tomato seed protein, supplement to corn proteins, growth promoting value, compared with peanut and soybean proteins.....1272
Toch.....1214	Tomhave, A. E.
Toch, Maximilian	Effect of ground soybeans on the cold storage quality of eggs. With C. W. Mumford.....1146
Soya-bean oil as a sub- stitute for linseed oil in paints.....727	Ground soybeans as a protein supplement for growing chicks. With C. W. Mumford.....1147
Soya bean oil for paint purposes.....728	Ground soybeans as a supple- ment for laying birds. With C. W. Mumford.....1148
Todd, G. R.: Growing cow peas and soy beans.....256	
Tofu <u>See</u> Soybean cheese	
Togano, Meiji: Quick method for brewing soy (patent).....1603	
Tohoku Imperial university, Sendai, Japan	
Manufacture of plastic products from proteid of soy bean.....611	
Researches on oil and proteids extraction from soy-bean.....208	



<u>Item</u>	<u>Item</u>
Tomhave, A. E. - Continued	Tseng, K. F.: On the preparation
Soybean meal and ground	of fuel oil by distillation
soybeans as protein	of the lime soap of soya
supplements for dairy	bean oil. With
cattle.....1025	Masanori Sato.....610
Soybeans as a protein supple-	Tso, Ernest (cited).....1403
ment to corn for fattening	Changes in the composition
pigs on forage.....1110	of blood in rabbits
Wheat and soybeans as a	.... fed on raw and cooked
feed for swine.....1111	.... soybeans. With S. M.
Tomlinson, W. S.: Soybeans	Ling.....1384
planted with corn.....943	Comparison of the
Toniue See Soybean milk	nutritive properties of
Tonnellier, A. C.: La soja hispida	soybean "milk" and "cow's"
y sus aplicaciones.....554	milk.....1385
Tophu See Soybean cheese	Development of an infant
Torres Herrera, J. M.: El haba	fed eight months on
soya, su cultivo y	a soybean milk diet.....1386
beneficio.....257	Nitrogen, calcium and
Torri, A. J.: Can country	phosphorus metabolism
elevators process soybeans?...729	in infants fed on
Towar, J. D.: Cowpeas, soy	soybean "milk." With
beans, and winter vetch.....258	Martin Yee and Tung-
Toyo See Soy sauce	Tou Chen.....1387
Trabut: Le soja legume.....555	Nitrogen metabolism in
Tractors and tractor equipment,	infants on graded intake
in production of corn and	of soybean "milk" proteins.
soybeans, Louisiana.....319-320	With Fu-T'ang Chu..1388-1389
Tracy, P. H.: Relation of	Soluble soybean milk
soybean hay and ground soybeans	powder and its adaptation
to flavor and composition	to infant feeding.
of milk and butter. With	With Ke-Chung Chang.....1192
W. B. Nevens.....1001	Tsugawa, Fukuichi: Soluble
Tree, N. F.: Chemical studies	protein extracted from
of the beans and their	soy bean (patent).....1604
utilization.....493	Tucker, M. E.: Analysis of
Trevithick, H. P.: Soya bean	soya bean oil for refining
oil refining committee [of	loss.....731
the American Oil Chemists	Tung oil
Society] report.....730	blended with soybean
Trichlorethylene used in	oil.....49
soybean extraction, in-	use in paints.....603
advisable.....1021	competition with soybean
Triemer, Fredo: Die spezifisch-	oil.....415
dynamische wirkung der	fire hazard same as
sojanahrung.....1383	linseed oil.....676
Trotter, I. P.: Soybeans and	southern, link with farming-
winter barley in one-year	for-industry movement of
rotation.....840	the North through
	soybean.....725

<u>Item</u>	<u>Item</u>
Turk, K. L.: Nutritive value of the proteins of corn-gluten meal, linseed meal, and soybean-oil meal. With F. B. Morrison and L. A. Maynard.....1162	Uhland, R. E.: Time of harvesting soybeans in relation to soil improvement and protein content of the hay.....380
Turk, L. M.: Composition of soybean plants at various growth stages as related to their rate of decomposition and use as green manure.....841	Unemployment, may be relieved by creation of new soybean industries.....92
Turkeys fed soybean oilmeal and gluten meal, experiments..1133 <u>See also Poultry</u>	Union of South Africa.....270,1112
Turner, A. G. report on soybeans.....268 Wonderful bean.....556	Union of South Africa. Dept. of agriculture. Cowpeas versus soya beans for pigs.....1112
Turner, F. Les graines de soja et l'huile de soja.....624 Soya beans and soya bean oil..624	Union of South Africa. Dept. of agriculture and forestry. Investigation into the composition of the soybean in South Africa.....270
Turnill, T. W.: Method or process of extracting oil from vegetable seeds, nuts, and the like. With Charles Downs and R. A. Bellwood (patent)..1464	Union of Soviet Socialist Republics.....101,177,431-432,485,536,604,1125,1182,1243-1244,1298,1303,1322,1357,1373,1417
Turnips, feeding value for hogs.....1077	U. S. Congress, Senate Committee on agriculture and forestry. Amendment of Agricultural marketing act; hearing.....419
Tussaud, G. P. Process of treating fat and oil-bearing seed products [including soybeans] (patent).....1605 Treatment of fat- and oil-bearing seeds (patent)....1605	U. S. Dept. of agriculture....247,548,1057,1382
Tussaud, J. T.....1218	Agricultural statistics, 1936-1937.....461
Twitchell reagent, soybean oil hydrolysis.....681	Brown-Duvel moisture tester and how to operate it.....421
Ueno, Seiichi: On the nutritive value of hydrogenated oils. With Matasaku Yamashita, Yasuo Ota, and Zensaku Okamura.....1390	Chemical study of ensiling soybeans.....918
	Cooking soy beans.....1391
	Crops and markets.....462
	cited.....464
	Monthly supplement.....463
	cited.....462
	Cystine deficiency of soybean protein at various levels, in a purified ration and as a supplement to corn.....930



	<u>Item</u>		<u>Item</u>
U. S. Dept. of agriculture - Cont'd		U. S. Dept. of agriculture - Cont'd	
development of new soybean		Pork firmness is modified	
varieties.....	173	by feed and other	
Digestibility of protein		factors.....	1062
supplied by soy-bean and		Pork of good quality	
peanut press-cake flours..	1239	grown efficiently on	
Digestibility of some seed		corn-soybean ration.....	1121
oils.....	1240	Relative efficiency for	
Effect of yeast and casein		growing lambs of the	
supplements to corn and		protein in rations sup-	
soybean rations when fed		plemented by soybean-	
to rats and swine.....	1100	oil meal, linseed meal,	
Food surveys (cited).....	474	or corn-gluten meal.....	1159
Graphic summary of farm		Rotations in the corn	
crops.....	447	belt.....	830
Handy helps in harvesting		Seed supply of the nation...	184
soy beans increase crop's		Selection for quality	
food and forage value.....	381	of oil in soy beans.....	643
Harvesting small grain,		Simple method for deter-	
soybeans, and clover in the		mining the oil content	
corn belt with combines or		of seeds and other	
binders.....	376	oil-bearing materials....	424
Harvesting soy-bean seed.....	369	Soy and related fermenta-	
Hay.....	191	tions.....	1198
Illustrated lecture on soy		Soy bean as a forage crop...	297
beans.....	166	Soybean hay and seed	
Imported soy bean seed.....	259	production.....	168
Improvement in soybeans.....	167	Soy-bean industry in	
investigation on soybean		the United States.....	170
harvesting methods in		Soybean industry is	
Virginia.....	356	rapidly developing	
Management of sandy-land		in United States.....	496
farms in northern Indiana		Soy bean; its culture	
and southern Michigan.....	768	and uses.....	174,813
Market reporter (cited).....	464	Soy-bean output increasing	
Monthly crop reporter		in United States.....	171
(cited).....	464,474	Soy-bean rotation increases	
National weather and crop		rice yields greatly.....	758
bulletin (cited).....	464,474	Soy-bean standards	
Nutritive value of green im-		promulgated for	
mature soybeans.....	1310	commercial crop.....	329
Nutritive value of mixtures		Soy bean useful crop.....	549
of proteins from corn		Soybean utilization.....	534
and various concentrates..	1272	Soy-bean varieties newly	
Nutritive value of the proteins		developed for U. S.	
of corn-gluten meal, lin-		farms.....	173
seed meal, and soybean-		soybean variety studies.....	4e
oil meal.....	1162		

Item

U. S. Dept. of agriculture - Cont'd	
Soy bean; with special reference to its utilization for oil, cake, and other products.....	194
Soy beans.....	822
Soy beans: culture and varieties.....	174, 813
Soy beans are profitable.....	842
Soybeans are valuable for silage when grown with other feed crops.....	879
Soy beans as food.....	1392-1393
Soybeans content of amino acids varies greatly with variety.....	430
Soy beans in systems of farming in the cotton belt.....	214
Soybeans in the United States; recent trends and present economic status.....	81
Soybeans make valuable food.....	1394
Soybeans now a major crop in United States.....	175
Soy beans, used like navy kind, make valuable food.....	1394
Study of ensiling a mixture of Sudan grass with a legume.....	954
Successful hog and seed-corn farm.....	1107
Threshing and storing to save soy-bean seed.....	382
Use native soy beans.....	259
Use soy-bean flour to save wheat, meat, and fat.....	1395
Weather, crops and markets.... (cited).....	464, 474
Year in agriculture.....	104
Yearbook. 1917-1935.....	465
U. S. Dept. of agriculture, Agricultural adjustment administration, Consumers' counsel. "Salute to the "wonder bean".....	207

Item

U. S. Dept. of agriculture, Bureau of agricultural economics.....	231, 410
Flax, soybeans, peanuts and cottonseed outlook charts.....	466
Handbook of instructions for the installation and operation of the Tag-Heppenstall moisture meter.....	423
Handbook of official hay standards... revised, effective April 1, 1936.....	338
Handbook of official United States standards for soybeans, effective September 3, 1935.....	339
Handbook of United States standards for soybeans effective September 1, 1926.....	339
Marketing soybeans basis U. S. standards.....	328
Official standards for soybeans.....	339
Protein tests for wheat and oil tests for flaxseed and soybeans.....	444
research work on moisture tester.....	422
Revised methods for operating the Brown-Duvel moisture tester.....	421
Rice, peanuts, soybeans, dry beans, and broomcorn outlook charts.....	467-468
Some analyses of commercial soybeans.....	427
Soybean appeal inspection procedure.....	340



<u>Item</u>	<u>Item</u>
U. S. Dept. of agriculture, Bureau of agricultural economics - Continued	U. S. Dept. of agriculture, Bureau of agricultural economics, Hay, feed and seed division - Cont'd
Soybean, cowpea, and velvet bean shipments, stocks, and prices.....469	Soybeans: the basis of a new industry.....497
Soybean outlook.....260	What price soybeans?.....569
Soybeans inspected by federal licensed inspectors.....341	U. S. Dept. of agriculture, Bureau of agricultural economics, Soybean inspection ser- vice.....328
standards for soy beans proposed.....334	U. S. Dept. of agriculture, Bureau of agricultural engineer- ing, observations in Mississippi Delta on grain combines.....355
Tentative grades for soybeans.....339	U. S. Dept. of agriculture, Bureau of chemistry and soils research in industrial utilization of farm products.....4e
Tentative United States standards for soybean and soybean mixed hay, issued November 1928....342	Soybeans - their food value.....527
United States standards for soybeans. Effective September 1, 1925.....339	studies on proteins of soy beans.....430
U. S. Dept. of agriculture, Bureau of agricultural economics, Crop reporting board, farmers' intentions to plant.....260	U. S. Dept. of agriculture, Bureau of chemistry and soils, Food research division.....1174
U. S. Dept. of agriculture, Bureau of agricultural economics, Division of farm management and costs. Harvesting soy beans.....377	Partial list of processes for removing the bitter taste from soybeans.....1295
U. S. Dept. of agriculture, Bureau of agricultural economics, Grain research laboratory, application of optical method of oil content determination..424	U. S. Dept. of agriculture, Bureau of chemistry and soils, Industrial farm products research divi- sion, projects.....4e
U. S. Dept. of agriculture, Bureau of agricultural economics, Hay, feed and seed division.	U. S. Dept. of agriculture, Bureau of chemistry and soils, Oil, fat and wax laboratory.....436
Soybeans crushed, oil and meal produced, imports and exports soybean products, and stocks of soybeans and soybean oil.....471	U. S. Dept. of agriculture, Bureau of chemistry and soils, Protein and nutri- tion research division, studies on changes in proteins of soybean meal as a result of storage.....482
Soybeans crushed, oil and meal produced, imports and exports soybeans and soybean products, and stocks of soybeans and soybean oil.....470	

<u>Item</u>	<u>Item</u>
U. S. Dept. of agriculture, Bureau of chemistry and soils, Protein investigation laboratory.....1268	U. S. Dept. of agriculture, Regional soybean industrial products laboratory <u>See</u> U. S. Regional soybean industrial products laboratory, Urbana, Ill.
U. S. Dept. of agriculture, Bureau of crop estimates. Cowpea, soy bean, and velvet bean production.....472	U. S. Dept. of agriculture, States relation service.....166
U. S. Dept. of agriculture, Bureau of home economics....1391, 1395	U. S. Dept. of agriculture, Sugar plant field station, Houma, La., field studies on soybeans and other legumes.....740
U. S. Dept. of agriculture, Bureau of markets Market reporter (cited)...473- 474 Seed reporter.....473 cited.....474	U. S. Dept. of commerce, Bureau of foreign and domestic commerce Manufacture of bean milk at Changsha.....1271 Soya beans for American mills.....262 Vegetable-oil-bearing materials of Manchuria.....453
U. S. Dept. of agriculture, Bureau of plant industry.....166 Soy bean.....261 Soy bean; history, varieties, and field studies.....193	U. S. Dept. of commerce, Bureau of foreign and domestic commerce, Far Eastern division. Oil and oilseeds of the Orient.....263
U. S. Dept. of agriculture, Bureau of plant industry, Division of forage crops and diseases.....436 Firms manufacturing or handling soybean food products.....1396	U. S. Dept. of commerce, Bureau of manufactures. Soap from soya beans.....702
U. S. Dept. of agriculture, Ex- tension service.....15 Use of Bankhead-Jones funds to promote a coordinated program of research between the states in coopera- tion with the United States department of agriculture.....589	U. S. Dept. of commerce, Bureau of the census. Fourteenth census of the United States. V. Agriculture.....475 United States census of agriculture.....475
U. S. Dept. of agriculture, Office of experiment stations. Digest of Japanese investi- gations on the nutri- tion of man.....1329 Soybean projects of the state agricultural experiment stations, 1935-36.....243 1937.....243	U. S. Dept. of commerce and labor, Bureau of manufactures Soya bean and products.....264 Waterproof liquid from bean oil.....737 U. S. National recovery adminis- tration. Proposed code of fair competition for the soybean products processing industry.....732



<u>Item</u>	<u>Item</u>
U. S. Regional soybean industrial products laboratory, Urbana, Ill.....4e,54,207,231,589,591-592,600	Untersteiner, Laura
agronomic and analytical divisions, work, objectives and purposes...4e,492	Contenuto in vitamina A e B delle farine di lenti, di avena e di soja.
plan and objectives.....492,590,600	With Di Renzo
research program.....4d,4e,605	Agnoli.....857
study on protein plastics from soybean products...570	Valore alimentare della farina di soja nella nutrizione dei giovani animali. With Di Renzo Agnoli.....858
varnish exposure tests.....691,707,719	Urinary infections, purulent, treatment with soybean diet.....1177
U. S. Tariff commission.	Vainman. Mekhanizatsiia i agrotekhnika soi. With Itskov and Ageev.....101
Certain vegetable oils.....476	Valdivia, M. A., tr. La pequeña planta honorable.....134
Production and transportation costs of certain oils.....733	Val'dman, G. A., drying and storing of soybean seed, with M. Dunin.....177
report on costs of production and transportation of oils.....144	Vanatter, P. O.: Soy beans and cowpeas. With J. R. Fain.....68
Report to the Congress on certain vegetable oils, whale oil, and copra.....733	Vandenburg, J. T., Jr.: Soybeans as a farm crop.....269
Summary of tariff information 1920.....265	Van Doren, C. A.
1921.....266	Cutting soybean harvesting costs. With W. L. Burlison.....383
1929 on Tariff Act of 1922. Schedule 1. Chemicals, oils, and paints.....267	Soybean hay studies. With G. H. Dungan.....4b
Survey of the American soya-bean oil industry.....477	Van Gundy, M. D.: Soy beans in the human diet.....4d
Tariff information surveys... articles in paragraphs 44 and 45 of the Tariff act of 1913, and related articles in other paragraphs.....477	Van Stolk, C. C. C. <u>See</u> Stolk, C. C. C. Van
U. S. Treasury dept.	Van Vlissingen, Arthur, Jr.: Automobiles and soybeans....625
Study of the blacktongue preventive action of 16 foodstuffs.....1227	Van Wyk, N. J.: Cowpeas and soybeans as fodder crops....843
Study of the pellagra-preventive action of dried beans, casein, dried milk, and brewers' yeast, with a consideration of the essential preventive factors involved.....1228	Varnish technology, researches.....668
	<u>See also</u> Soybean oil, uses, in paint and varnish manufacture
	Venturi, Romolo (cited).....1211

<u>Item</u>	<u>Item</u>
Venturi, Romolo - Continued	Vestal, C. M. - Continued
Alcune considerazioni di ordine sperimentale circa l'utilizzazione della soia per l'alimentazione umana.....1398	Soft pork - cornbelt.....1116
La soia, come materia prima nella fabbricazione di importanti prodotti terapeutici ed industriali.....558	Soybean and mineral supplements for fattening hogs.....1117
Vera, Bonifacio de: Effect on leprosy of certain oils not in the chaulmoogra group.....1399	Soybeans as a substitute for tankage in fattening spring pigs on legume pasture.....1118
Vermont.....520,644	Soybeans pay in fattening hogs.....4a
Vermont. Agricultural experiment station.....644	Vetch, winter.....258
Concerning alfalfa and soy beans.....520	Vetch hay, with cowpea and soybean hay, substitute for wheat bran, in dairy cow ration.....964
Vermont. University. College of agriculture, Extension service.....644	Vienna. Food physiology laboratory. (Das ernährungs-physiologische laboratorium), founding and publications 1178c
Vermont farm bureau.....644	Viljoen, N. J.: Investigation into the composition of the soybean in South Africa.....270
Véron, Diego: Bean flour and process of making same (patent).....1606	Villanueva, E. R.: Physical characteristics and chemical composition of various brands of toyo (soy sauce) sold in the Philippines. With F. T. Adriano, S. B. Oliveros, and D. S. Santos.....1170
Vestal, C. M.	Villegas.....984
Effect of soybeans, soybean oil meal, and tankage on the quality of pork. With C. L. Shrewsbury .....1113	Virginia.....45,89,229,271,350,356,378,392,782,787,844,984
Effect of yeast and casein supplements to corn and soybean rations when fed to rats and swine. With C. L. Shrewsbury and S. M. Hauge.....1100	Virginia. Agricultural experiment station.....378
Effects of soybeans and soybean products on pork quality. With C. L. Shrewsbury.....1114	Comparative value of peanut meal, cottonseed meal and soybean meal as sources of protein for milk production.....984
Nutritive value and mineral deficiencies of soybeans. With C. L. Shrewsbury.....1101	investigation on soybean harvesting methods....356
Nutritive value of soybeans with preliminary observations on the quality of pork produced. With C. L. Shrewsbury.....1115	Soybean culture.....392



<u>Item</u>	<u>Item</u>
Virginia. Dept. of agriculture and immigration Comparison of the cowpea and the soy bean.....844	W. Die sojabohne und ihre verwendung in der nährmittelbranche .....273
Soy bean.....271	W., J.: Combine harvester moves to Iowa.....384
Soy bean useful crop.....549	Waal, A. J. C. de: Over soja-producten.....560
Try soy beans for pasture.....787	Waerden, H. van der: De sojaboon.....445
Virginia Agricultural and mechanical college and polytechnic institute. Ten lessons on soy beans and cow peas.....89	Wahl, Robert: Malted food and process of producing the same (patent).....1607
Virginia Agricultural and mechanical college and polytechnic institute, De- partment of agronomy.....378	Wai, Nganshou: New species of mono-mucor, mucor sufu on Chinese soybean cheese.....1400
Vitamins.....501	Waksman, S. A.: On the preparation of a soluble protein extract from soy beans.....1401
vitamin A effect of active soybean upon.....1221	Walker, B. H.: Checking up the soys.....845
suppressing factor in soybeans, not completely removed by extraction with ethyl ether and ethyl alcohol.....974	Wallace, Q. W.....1150
vitamin D, growth-promoting properties.....861	Walter, E. D.: Isolation of sucrose from soybeans. With H. R. Kraybill and R. L. Smith.....592
See also Soybeans, vitamin content	Wan, Shing Comparison of soybeans and milk in contents of vitamins B <sub>1</sub> and B <sub>2</sub> .....1402
Vlachos, C. A.: Fire and explosion hazards of commercial oils. With William Vlachos.....734	Comparison of the dietary properties of "soybean milk" and cow's milk.....1403
Vlachos, William: Fire and explosion hazards of com- mercial oils. With C. A. Vlachos.....734	Wand, F. A. Commercial outlet for soybeans.....4a
Von Liebenstein, E. R.: Over de beteekenis van de sojaboon als handelsproduct. With D. F. Blokhuis.....61	Handling and preparing soybeans for market.....274
Voorhees, J. H.: Soybean in New Jersey.....272	Relation between the soybean grower and the oil mill.....4
Voskresenski, C. M.....1357	Safe storing of soybeans....490
Voskresenskii, V. M.: Soybean milk. With T. K. Dobruinina.....1298	Soybean industry.....275
	Soybean industry in this country.....276
	Varieties of soy beans best for manufacturing.....626

<u>Item</u>	<u>Item</u>
Wang, Ying-Lai: Digestibility of the protein of soybean milk... With W. H. Adolph.....1164	Weaver, Earl - Continued
Wapello County, Iowa.....291,384	Soybeans as a home-grown supplement for dairy cows. With A. C. McCandlish and L. A. Lunde.....998
Ware, A. M.: Soya bean.....277	Weaver, L. A.
Ware, E. E.	Hogging down corn and soybeans.....1119
Role of soy bean oil in paint formulation.....49	Soybeans and soybean oil meal in swine rations...1120
Soybean oil and the paint industry.....735	Weber, B. T.: Soy beans for seed.....385
Soybean oil in paints.....49	Weber, J.: Die fütterung nicht entfetteter sojabohnen an mastschweine. With V. Horn and K. Jungermann.....1067
Soybean oil in the paint industry.....493	Webster, J. E.
Warner, H. W.: Soys for soil fertility.....346	Oil and protein studies of Oklahoma grown soy beans. With B. F. Kiltz.....446
Warren, Raymond, farm, Wapello Co., Iowa.....384	Soybeans in Oklahoma.....186
Washburn.....668	Weed, A. R.: Soy beans a standard Illinois crop.....278
Washburn, F. M.: New hexabromide test for linseed oil. With L. L. Steele.....664	Weeds, control, rice rotated with soybeans, Louisiana....758
Washburn, W. F.: Soya bean oil...736	Weiser, Stefan.....1216
Washington (State).....539,731,1442,1456,1459-1461,1466,1497,1503,1506-1507	Wells, Ralph, & co., Monmouth, Ill., soybean processing plant.....641
Washington State planning council, Spokane, Washington.....539	Welton, F. A.: Soybean and cowpea. With C. G. Williams.....854
Wastl, H.: Das haltbare sojamehl ein volksnahrungsmittel der zukunft.....1404	Werner & Mertz Gesellschaft n.b.H. Verfahren zur veredelung von sojabohnen (patent).....1608
Wastl, Helene.....1216	Wesson.....424,730
Das haltbare sojamehl.....1178	West, A. P.: Composition of Philippine soy beans and soy-bean oil. With A. O. Cruz.....508
Das sojamehl als nahrungsmittel.....1178	West Virginia.....37,57,766-767,920,955
Watson, C. J.: Digestibility of Canadian feeding stuffs - soybean oil meal. With J. C. Woodward, W. M. Davidson, G. W. Muir, and C. H. Robinson.....944	
Watts, Betty Monaghan <u>See</u> Monaghan-Watts, Betty	
Weaver, D. S., harvesting soybeans.....350	
Weaver, Earl	
Coconut meal, gluten feed, peanut meal, and soy bean meal as protein supplements for dairy cows. With A. C. McCandlish.....997	



<u>Item</u>	<u>Item</u>
West Virginia. Agricultural experiment station.	Wheat - Continued
Some factors affecting the influence of soybeans, oats, and other crops on the succeeding crop.....767	bran
Soybean vs. alfalfa hay for milk production.....955	analysis, same as
Soy beans - an important West Virginia crop.....37	soybean hay.....308
Soybeans for silage and for hay.....920	and dried brewers' grains in dairy ration, vs.
West Virginia. Agricultural experiment station, Department of soils.....766	cottonseed meal.....992
Scientific paper.....59	compared with soybean hay and mixed hay in milk production....809
West Virginia. University.	place in rations.....308
College of agriculture,	prices.....308
Extension division. Growing soybeans.....57	consumption, sustained and promoted by shifting wheat from class of energy producing foods to that of full value foods.....1252
Westbrook, E. C.: Results with special crops in the Piedmont section in 1922.....279	feed for hogs.....1077,1111
Weston, F. E.: Technical handbook of oils, fats and waxes. With P. J. Fryer.....663	flour
Wettach, Melville: Soy beans for the Corn belt.....386	proteins
Whalin, O. L.	supplement baker's yeast proteins....1287
Le commerce international des fèves de soya et de leurs sous-produits.	supplement soybean flour proteins....1287
With C. L. Stewart.....418	supplemented by mixture of peanut and soybean flour, nutritive value.....1272
Production and utilization of soybeans and soybean products in the United States. With W. L. Burlison.....25	supplemented with soybean flour
Supply and marketing of soybeans and soybean products. With C. L. Stewart, W. L. Burlison, and L. J. Norton.....245	baking tests 1187,1207
Wheat	nutritive value...1270
amino acid deficiency,	used in bread,
growth in white rat.....1311	French army....1175
	in rotation
	with corn.....830
	with corn, soybeans and clover.....64
	Champaign County, Ill.....836
	Indiana.....63
	middlings and corn, in hog rations, superior to soybeans and corn meal..1070

<u>Item</u>	<u>Item</u>
Wheat - Continued	Wiggins, R. G.
protein surveys	Cayuga soybean.....284
benefit to grain	Combinations of corn and
industry.....444	soybeans for silage.....1026
importance in production	Corn and soybeans for
and marketing.....444	silage.....946
surplus, replacement by	Effect of growing corn
soybeans.....276	and soybeans in combination
yields	on the percentage of dry
following soybean hay cut	matter in the two
at different dates.....253	crops.....947
following soybeans.....805	Pole beans vs. soybeans
Wheeler, A. A.: Consider the	as a companion crop with
soy bean.....561	corn for silage.....948
Wheeler, G. A.: Study of the	Soybeans in the northeast...849
blacktongue preventive action	Varietal experiments with
of 16 foodstuffs. With Joseph	soybeans in New York.....285
Goldberger, R. D. Lillie, and	Wilbur, J. W.
L. M. Rogers.....1227	Attempt to remove the
White, Buxton: Soy bean industry	vitamin A suppressing
of eastern North Carolina.....562	factor in soybean oil
White, Fabian: Flour production	by adsorbents. With
1178b	S. M. Hauge and J. H.
White, P. S.: Utilization of	Hilton.....674
soy bean and corn proteins	Comparison between ground
as affected by suitable	soybeans and linseed
mineral supplements. With	oilmeal as protein sup-
D. C. Kennard and R. C.	plements for growing dairy
Holder.....1136	calves. With J. H.
Whittier, A. C.: Study of soy	Hilton and S. M.
bean hay.....945	Hauge.....979
Whittle, C. A.: Why soy beans?...280	Early, intermediate and
Wiancko, A. T.	late cut soybean hay
Soy beans and cowpeas. With	for milk and butterfat
M. L. Fisher and C. O.	production. With
Cromer.....154,847	J. H. Hilton and
Soy beans, cowpeas, and	W. F. Epple.....980
other forage crops. With	Effect of soybeans in the
M. L. Fisher.....281	rations of dairy cows
Soybeans in Indiana. With	upon the vitamin A value
C. O. Cromer.....282	of butter. With J. H.
cited.....848	Hilton and S. M.
Soybeans in Indiana. With	Hauge.....1027
R. R. Mulvey.....848	Further study of the factor
Soybeans in the Corn belt.....283	in soybeans affecting
Wieseahn, G. A.: Soybean phos-	vitamin A value of butter.
phatides and their uses.....628	With S. M. Hauge and
	J. H. Hilton.....974



<u>Item</u>	<u>Item</u>
Wilbur, J. W. - Continued	Wilkins, F. S. - Continued
Further study of the factor	Facts about soybeans
in soybeans affecting	in corn.....652
the vitamin A value of	Growing soy beans as a
butter. With S. M.	cash crop.....287
Hauge and J. H. Hilton....1028	Growing soy beans in
Ground soybeans and linseed	corn.....949
oil meal for growing	Harvesting and threshing
dairy calves. With J. H.	soy beans.....387
Hilton and S. M. Hauge.....981	Soybeans. With H. D.
Soybean hay.....1029	Hughes.....783
Soy bean oilmeal and ground	Soybeans for Iowa. With
soy beans as protein	H. D. Hughes.....784
supplements in dairy	Soy beans in Iowa. With
rations. With L. H.	H. D. Hughes.....94
Fairchild.....965	Soybeans in Iowa farming.
Soybean oilmeal and ground	With Albert Mighell
soybeans as protein	and H. D. Hughes.....151
supplements in the	Soybeans in the Cornbelt....289
dairy ration. With L. H.	Soybeans in the Cornbelt.
Fairchild.....966	A legume that is easily
Soybeans and soybean products	grown and yields well....288
for dairy cows. With	Soybeans to replace oats....290
J. H. Hilton.....4c	Use soy beans to replace
Soybeans for dairy cows in-	oil meal.....950
crease fat in milk.....1030	Where soybeans replace
Vitamin A activity of butter	oats.....291
produced by cows fed alfalfa	Wilkins, L. K.: Factors in-
hay and soybean hay cut	fluencing the protein
at different stages of	content of soy beans.
maturity. With J. H.	With J. G. Lipman, A. W.
Hilton and S. M. Hauge.....982	Blair, and H. C.
When should we cut soybeans	McLean.....434
for hay? With J. H.	Willaman, J. J.: Soy bean,
Hilton.....983	the most perfect crop
Wilcox, E. V.: Soy beans	plant.....1405
hobnobbing with corn.....850	Willard, C. J.
Wilder, S. W.....333	Growing soybeans in corn.
Wilgus, H. S., Jr.: Effect of	With J. B. Park and
heat on nutritive value of	H. L. Borst.....818
soy-bean meal. With L. C.	Harvesting soy beans for
Norris and G. F. Heuser.....1149	hay.....388
Wilkins, F. S.....823	Harvesting soybeans for
Buying soy bean seed.....286	hay. With L. E. Thatcher
Effect of sudan grass and of	and J. B. Park.....389
soybeans on the yield of	Soybean hay.....951
corn. With H. D. Hughes...851	Time of harvesting soybeans
	for hay and seed.....390

<u>Item</u>	<u>Item</u>
Williams, C. B.	Winkler, E. C. - Continued
Harvesting soy beans.....391	Verfahren zur konservierung
letters to, from manufacturers	und geschmacksveredelung
using soybean oil.....699	von sojabohnen oder
Producing soybean seed for the	früchten von anderen
oil mills.....4	leguminosen. With
Soy bean growing in North	Hubert Goller (patent)..1609
Carolina.....292-293	Winnabago County, Ill.....937
Soy-bean products and	Winter, F. L.: Bar-cylinder
their uses.....563-564	soybean thresher. With
Soybeans: a future economic	W. J. Mumm.....370
factor in North Carolina...565	Winters, R. Y.
Soy beans for seed.....294	Soybeans for the Piedmont
Soy beans in North Carolina...295	and mountain sections of
Williams, C. G.	North Carolina. With
Harvesting soybeans.....296	V. R. Herman.....299
Soy bean.....853	Soybeans in North Carolina....4
Soybean and cowpea. With	Winters, S. R.: Soybean,
F. A. Welton.....854	the "wonder" bean.....566
Soybean culture.....296	Wisconsin.....20,76,136,158-160,
Soybeans: their culture	223,225,239,433,590,643,695,
and use. With J. B.	747,774,868,870,910,952,1032-
Park.....296	1033,1037,1065,1070,1128,
Williams, N. K.: Production of	1131,1154,1160,1234,1309
dairy cows when fed only	Wisconsin. Agricultural experi-
silage and cracked soybeans.	ment station.....695,1234,1131
With C. Y. Cannon and	Findings in farm
D. L. Espe.....1031	science. Annual
Williams, T. A.: Soy bean as a	report.....952
forage crop.....297	Soybean hay for milk
Williams County, Ohio.....137	production.....1032
Williamson, A. A.....737	soybean hog feeding
report on Manchurian	experiments.....1065
soybean industry.....262	Soybean oil prevents
Williamson, H. H.....47	one type of chick
Wilson, H. D.: Soy beans.....298	paralysis.....1128
Wilson, R. C., Jr.: Nutritive	Soybean silage as a
protein of some newly	food for dairy cows..1033
developed soy beans. With	Soybeans - a crop worth
A. A. O'Kelly and Watt	growing.....158
Smith.....1324	Soybeans - a good legume
Wing, J. E.: Meadows and	crop borrowed from
pastures.....855	the Orient.....159
Winkler, E. C.	Soy beans - an important
Process for disembittering and	Wisconsin crop.....160
improving soya beans or like	Soy beans vs. middlings
legumes. With Hubert	as a supplement to
Goller (patent).....1609	corn meal for
	fattening pigs.....1070



<u>Item</u>	<u>Item</u>
Wisconsin. Agricultural exper- iment station - Continued	Woertge, K. H.: Entwicklung und weltwirtschaftliche bedeutung der sojabohnener- zeugung und verarbeitung.....300
Value of soy beans as a part of a grain ration for lambs.....1160	Wolfe, T. K.: Soybean culture..392
Value of soy beans in grain rations for lambs.....1154	Woll, F. W.: Soy bean silage as a food for dairy cows. With G. C. Humphrey.....1033
Wisconsin. Agricultural exper- iment station, Department of genetics.....643	Wong, T.: Soy-bean in- dustries.....629
Paper.....71	Wood sugar yeast in dairy ration, effect upon quantity and fat content of milk compared with soybean oilmeal.....1005
Wisconsin. University feeding experiments with soybean oilmeal for pigs.....1037	Woodruff, Sybil Edible varieties of soybeans.....4e
National soybean field day....136	Food uses for varieties of beans. With Helen Klaas.....493
nutritional program with soybean oilmeal.....868	Study of soybean varieties with reference to their use as food. With Helen Klaas.....1406
Wisconsin. University. College of agriculture. Grow more feed series.....20	Woods, C. D.: Soy beans in Maine. With J. M. Bartlett.....301
Wisconsin. University. College of agriculture, Department of agronomy.....433	Woodward, J. C.: Digestibility of Canadian feeding stuffs - soybean oil meal. With C. J. Watson, W. M. Davidson, G. W. Muir, and C. H. Robinson.....944
Wisconsin. University, College of agriculture, Extension division. Soybeans and other supplementary feed crops.....870	Woodworth, C. M. Recent results in soybean breeding and genetics.....4e
Wisconsin. University, College of agriculture, Extension service. Grow soybeans.....20	Selection for quality of oil in soy beans. With L. J. Cole and E. W. Lindstrom.....643
Soybean dishes new and old.....1309	Wool, synthetic from milk casein.....603 from soybeans.....507
Withers, J. H., soybeans as a cause in increasing milk production.....893	Wooster, Ohio.....253
Withrow, L. J.: Twenty years with soybeans. Conclusions derived from experience on Meharry Farms. With C. L. Meharry, W. E. Riegel, E. N. Stafford, and J. M. Crumbaker.....4a	
Withrow, W. A.: Growing soy beans in Indiana.....953	

<u>Item</u>	<u>Item</u>
Worden, A. M.: What is the most profitable method of handling soy beans?.....302	Yamashita, Matasaku: On the nutritive value of hydrogenated oils. With Seiichi Ueno, Yasuo Ota, and Zensaku Okamura.....1390
Working, E. J.: Have soy beans moved up?.....630	Yazaki, Ataru: Nutritive value of soy-bean cakes. With Kozo Suzuki.....722,1377
Worlds poultry congress. Soya bean cake as protein supplement of poultry feed.....1145	Yazoo-Mississippi Delta.....799
Wright, P. A.: Study of ensiling a mixture of sudan grass with a legume. With R. H. Shaw.....954	Yeast baker's, proteins supplement white wheat flour proteins.....1287
Wright, P. G.: Tariff on animal and vegetable oils.....478	brewer's dried, source of vitamin G.....1299
Wu, G. M.: Additional notes on soy-bean products. With W. H. Adolph.....1163	pellagra-preventive action.....1228
Wuyts, L.: Le tourteau de soya et la qualité du beurre.....1034	fed to hogs, effect on deposition of nitrogenium.....1099
Wyk, N. J. van <u>See</u> Van Wyk, N. J.	Yee, Martin: Nitrogen, calcium and phosphorus metabolism in infants fed on soybean "milk." With Ernest Tso and Tung-Tou Chen.....1387
Yale university, Sheffield laboratory of physiological chemistry.....1327	Yenching university, Peiping. Department of chemistry....1166
Yamada, Aritomo: Organic fertilizers. VIII. Soy bean as a green manure. With Kiyohisa Yoshimura and Kotaro Nishida.....856	Yeu, Lucie, study of soybean milk.....1292
Yamada, T.: Removal of solid components from fatty oils and drying properties of the residual oils. I. On soya-bean oil.....738	York, H. A.....47
Yamamoto, Yoshitaro Imitation powdered milk. With Isome Mizusawa and the Tokyo Takushoku Kabushiki Kaisha (patent).....1610	Yoshida, K.: Extracting oils such as soybean oil by pressure (patent).....1613
Process of deodorizing and decoloring bean flour. (patent).....1611	Yoshimaru, Y. Nutritive value of the alcohol-extracted oil cake. With S. Izume and I. Komatsubara.....934
Process of preparing odorless and colorless oil and flour from [soya] bean (patent) 1612	Oil-extracting process and digestion coefficient of the protein. With S. Izume.....934
	Soy-bean oil cake as a food and its nutritive value. I-II. With Seiichi Izume.....1264



<u>Item</u>	<u>Item</u>
Yoshimaru, Yoshinori - Continued	Young, E. C. - Continued
Studies on experimental	Proper place for soybeans
rickets. II. With	in the system of
Seiichi Izume and Isao	farming.....4a
Komatsubara.....1266	
Vitamin D. IV. With Seiichi	Zahnley, J. W.
Izume and Tei Hidaka.....1267	Soybean production in
Yoshimura, Kiyohisa: Organic	Kansas.....303
fertilizers. VIII. [Soy	Soybeans in Kansas....
bean as a green manure.]	With H. H. Laude.....797
With Kotaro Nishida and	Zeller, J. H.: Pork of good
Aritomo Yamada.....856	quality grown efficiently
Young, A. L.	on corn-soybean ration.
Soybean harvesting	With O. G. Hankins.....1121
machinery.....4b	Zenin, N. S.: Nutrient value
Soybean harvesting	of edible fats and
studies.....4e	oils. With A. K.
Young, E. C.	Pickat, P. I. Alekseeva,
Costs and profits in pro-	and O. Kurtsina.....1335
ducing soybeans in	Zlataroff, Assen: Die soja
Indiana. With L. G.	und ihre verwertung als
Hobson.....326	nahrungsmittel.....1407
Costs and profits in pro-	Zmigrod, Stanislaw: Oil and
ducing soybeans in north	flour from the soy
central Indiana, crop of	bean.....567
1923. With L. G. Hobson...327	

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